1. Which of these fractions is largest?

$\frac{1}{2}$ ◯ $\frac{1}{3}$ ◯ $\frac{1}{6}$ ◯

2. Which of these fractions is smallest?

$\frac{1}{4}$ ◯ $\frac{1}{5}$ ◯ $\frac{1}{8}$ ◯

3. Which fraction is NOT equal to one?

$\frac{6}{6}$ ◯ $\frac{4}{5}$ ◯ $\frac{4}{4}$ ◯

4. What part of this circle is shaded?

$\frac{4}{6}$ ◯ $\frac{2}{3}$ ◯ $\frac{5}{6}$ ◯

5. Which are the numerators of $\frac{2}{3}$ and $\frac{4}{5}$?

◯ 3, 5   ◯ 2, 4   ◯ 2, 3

6. Which are the denominators of $\frac{3}{8}$ and $\frac{5}{6}$?

8, 6 ◯   3, 5 ◯   5, 6 ◯

7. When a rectangle is divided into _____ parts, the parts are called eighths.

        8 unequal ◯   8 equal ◯

8. The more parts a circle is divided into, the _____ each part will be.

        smaller ◯   larger ◯

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1. Does the order in which you multiply fractions make a difference?

$$\left(\frac{1}{2} \times \frac{1}{3} = \frac{1}{6} \qquad \frac{1}{3} \times \frac{1}{2} = \frac{1}{6} \right)$$

YES ○   NO ○

2. When the numerator and denominator of a fraction are multiplied by the same number, the value of the product is _____ the original fraction.

$$\left(\frac{3}{4} \times \frac{2}{2} = \frac{6}{8} \right)$$

larger than   smaller than   the same as

○   ○   ○

3. How do you write the whole number 4 as a fraction?

○ $\frac{4}{1}$ ○ $\frac{1}{4}$

4. What is the product of $\frac{2}{7} \times 4$?

○ $\frac{2}{28}$ ○ $\frac{8}{7}$ ○ $\frac{8}{28}$

5. Which is the correct way to multiply $\frac{1}{5} \times \frac{2}{3}$?

○ $\frac{1 \times 2}{5 \times 3}$ ○ $\frac{1+2}{5+3}$ ○ $\frac{1 \times 3}{5 \times 2}$

Find these products:

6. $\frac{2}{3} \times \frac{5}{7}$ = ? $\frac{7}{10}$ ○ $\frac{10}{21}$ ○ $\frac{7}{21}$ ○

7. $\frac{3}{4} \times \frac{2}{5}$ = ? $\frac{6}{9}$ ○ $\frac{6}{20}$ ○ $\frac{5}{9}$ ○

8. Is $\frac{1}{2} \times \frac{1}{4}$ the same amount as $\frac{1}{2}$ of $\frac{1}{4}$?

YES ○   NO ○

1. Which fraction has a common denominator
   with $\frac{7}{10}$?

   ○ $\frac{7}{3}$ ○ $\frac{10}{7}$ ○ $\frac{3}{10}$

2. $\frac{1}{4} \times \frac{3}{3} =$?

   ○   ○   ○
   $\frac{4}{12}$ $\frac{3}{12}$ $\frac{4}{7}$

3. Which fraction should you multiply by here?

   $\frac{4}{7} \times$? $= \frac{\nabla}{21}$

   ○ $\frac{2}{2}$ ○ $\frac{3}{3}$ ○ $\frac{4}{4}$

4. What is a common denominator for $\frac{1}{3}$ and $\frac{1}{4}$?

   ○ 7   ○ 12   ○ 9

5. Which is not a prime number?

   ○ 11   ○ 3   ○ 9

6. Do 3 and 8 have any factors in common
   except 1?
   ○ Yes   ○ No

7. What is a common denominator for $\frac{1}{3}$ and $\frac{1}{8}$?

   ○ 8   ○ 11   ○ 24

1. Is $\frac{8}{12}$ equivalent to $\frac{2}{3}$?

   ◯ Yes   ◯ No

2. Which number can $\frac{3}{6}$ be divided by?

   ◯ 2   ◯ 3   ◯ 4

3. What is $\frac{2}{7}$ x 3?

   ◯ $\frac{2}{21}$ ◯ $\frac{5}{7}$ ◯ $\frac{6}{7}$

4. What is the reciprocal of 9?

   ◯ $\frac{9}{0}$ ◯ $\frac{1}{9}$ ◯ $\frac{9}{1}$

5. What is the reciprocal of $\frac{1}{4}$?

   ◯ $\frac{0}{4}$ ◯ $\frac{4}{0}$ ◯ 4

6. Does this product equal 1? $\frac{5}{11}$ x $\frac{11}{5}$ $\stackrel{?}{=}$ 1

   ◯ Yes   ◯ No

7. To reduce a fraction _____ the numerator and denominator by the same number.

       multiply   divide

       ◯   ◯

1. Is this fraction reduced correctly?

$$\frac{10 \div 2}{12 \div 3} = \frac{5}{4}$$

   ◯ Yes   ◯ No

2. Can $\frac{5}{8}$ be reduced?

   ◯ Yes   ◯ No

3. What is the largest number you can divide $\frac{21}{42}$ by?

   ◯ 21   ◯ 7   ◯ 3

4. Which fraction is the divisor in this problem? $\frac{1}{3} \div \frac{4}{5}$

   ◯ $\frac{1}{3}$ ◯ $\frac{4}{5}$

5. To divide 2 fractions, invert the divisor and _____ .

   ◯ multiply   ◯ add   ◯ divide

6. $\frac{3}{4} \div \frac{1}{2}$?

   ◯ $\frac{4}{6}$ ◯ $\frac{3}{8}$ ◯ $\frac{6}{4}$

7. Which fraction is equal to 8?

   ◯ $\frac{8}{1}$ ◯ $\frac{8}{0}$ ◯ $\frac{1}{8}$

1. Which is a Proper Fraction?

   ○ $\frac{15}{9}$ ○ $\frac{1}{2}$ ○ $\frac{4}{1}$

2. What is $\frac{5}{5}$?

   Proper Fraction   Improper Fraction
        ○   ○

3. Change $\frac{10}{3}$ to a mixed number.

   ○ $7\frac{1}{3}$ ○ $3\frac{1}{3}$ ○ $2\frac{2}{3}$

4. Change $\frac{15}{2}$ to a mixed number.

   ○ $13\frac{1}{2}$ ○ $7\frac{1}{2}$ ○ $8\frac{1}{2}$

5. Which kind of fractions do you change to
   mixed numbers?

        ○ Improper   ○ Proper

6. Which is $3\frac{2}{5}$ equal to?

   ○ $\frac{17}{5}$ ○ $\frac{13}{5}$ ○ $\frac{10}{5}$

7. Which is $10\frac{1}{6}$ equal to?

   ○ $\frac{60}{6}$ ○ $\frac{61}{6}$ ○ $\frac{60}{10}$

1. Change $5\frac{4}{7}$ to an improper fraction.

  ○ $\frac{55}{7}$ ○ $\frac{39}{7}$ ○ $\frac{27}{7}$

2. $3\frac{1}{3} \times \frac{4}{5} = ?$

  ○ $\frac{40}{15}$ ○ $\frac{28}{15}$ ○ $\frac{50}{12}$

3. $6\frac{2}{9} \times \frac{1}{4} = ?$

  ○ $\frac{108}{36}$ ○ $\frac{56}{36}$ ○ $\frac{224}{9}$

4. $1\frac{1}{2} \div \frac{1}{2} = ?$

  ○ $\frac{6}{2}$ ○ $\frac{3}{4}$ ○ $\frac{2}{6}$

5. Which fraction is the divisor?

  $\frac{4}{3} \div \frac{3}{4}$

  ○ $\frac{4}{3}$ ○ $\frac{3}{4}$

6. $1\frac{2}{3} \div \frac{3}{4} = ?$

  ○ $\frac{20}{9}$ ○ $\frac{15}{12}$ ○ $\frac{9}{6}$

1. Which are Like Fractions?

   ○ $\frac{2}{3}, \frac{5}{3}$ ○ $\frac{1}{5}, \frac{1}{4}$

2. Which is $\frac{4}{4}, \frac{4}{7}$?

         Like Fractions   Unlike Fractions

            ○   ○

3. $\frac{7}{8} + \frac{4}{8} = ?$

   ○ $\frac{11}{8}$ ○ $\frac{28}{64}$ ○ $\frac{11}{16}$

4. $\frac{8}{10} - \frac{3}{10} = ?$

   ○ $\frac{5}{10}$ ○ $\frac{24}{10}$ ○ $\frac{11}{10}$

5. $\frac{1}{2} + \frac{2}{3} = ?$ (Use paper.)

   ○ $\frac{12}{6}$ ○ $\frac{1}{6}$ ○ $\frac{7}{6}$

6. What is a common denominator for $\frac{3}{4} + \frac{1}{3}$?

   ○ 7   ○ 12   ○ 1

7. Which kind of fractions need a common denominator before they can be added?

   ○ Like   ○ Unlike

1. Which is a mixed number?

$\frac{1}{2}$ $3\frac{1}{3}$ .75
◯   ◯   ◯

2. $6\frac{3}{9}$

   $+ 1\frac{2}{9}$ $7\frac{1}{9}$ $6\frac{6}{9}$ $7\frac{5}{9}$
   ?   ◯   ◯   ◯

3. $3\frac{7}{8}$

   $+ 2\frac{4}{8}$
   ? $5\frac{3}{8}$ $6\frac{3}{8}$ $5\frac{11}{8}$
          ◯   ◯   ◯

4. _____ fractions should be changed to mixed numbers.

   ◯ Proper   ◯ Improper

5. $5\frac{4}{9}$

   $- 1\frac{2}{9}$ $4\frac{2}{9}$ $4\frac{6}{9}$ $6\frac{6}{9}$
   ?   ◯   ◯   ◯

6. $5\frac{6}{10}$

   $- 2\frac{7}{10}$ $3\frac{1}{10}$ $2\frac{9}{10}$ $3\frac{9}{10}$
   ?   ◯   ◯   ◯

7. 9

   $- \frac{1}{7}$ $8\frac{6}{7}$ $9\frac{6}{7}$ $9\frac{1}{7}$
   ?   ◯   ◯   ◯

Choose the correct decimal number
for each of the following simple
fractions.

$\frac{1}{2}$ ◯ .25   ◯ .5   ◯ .75

$\frac{1}{3}$ ◯ 33 $\frac{1}{3}$ ◯ .125   ◯ .66 $\frac{2}{3}$

$\frac{2}{3}$ ◯ .250   ◯ 1. 33 $\frac{1}{3}$ ◯ .66 $\frac{2}{3}$

$\frac{1}{4}$ ◯ .125   ◯ .25   ◯ .2

$\frac{3}{4}$ ◯ .75   ◯ .250   ◯ .4

$\frac{1}{5}$ ◯ .25   ◯ .1   ◯ .2

$\frac{2}{5}$ ◯ .50   ◯ .4   ◯ .2

$\frac{3}{5}$ ◯ .75   ◯ .6   ◯ .3

$\frac{1}{6}$ ◯ .125   ◯ .16 $\frac{2}{3}$ ◯ .33 $\frac{1}{3}$

$\frac{1}{8}$ ◯ .16 $\frac{2}{3}$ ◯ .125   ◯ .25

D-287

Choose the correct percent for each
of the following fractions:

$\frac{1}{2}$ ◯ 25%   ◯ 75%   ◯ 50%

$\frac{1}{3}$ ◯ 30%   ◯ $33\frac{1}{3}$ %   ◯ 33%

$\frac{1}{4}$ ◯ 25%   ◯ 20%   ◯ $22\frac{1}{2}$ %

$\frac{1}{5}$ ◯ $16\frac{2}{3}$ %   ◯ 25%   ◯ 20%

$\frac{1}{6}$ ◯ $12\frac{1}{2}$ %   ◯ $33\frac{1}{3}$ %   ◯ $16\frac{2}{3}$ %

$\frac{1}{8}$ ◯ $16\frac{2}{3}$ %   ◯ $12\frac{1}{2}$ %   ◯ 25%

$\frac{2}{3}$ ◯ $66\frac{2}{3}$ %   ◯ $78\frac{1}{2}$ %   ◯ $62\frac{1}{3}$ %

$\frac{3}{4}$ ◯ 75%   ◯ 80%   ◯ $82\frac{1}{2}$ %

$\frac{4}{5}$ ◯ $66\frac{2}{3}$ %   ◯ 75%   ◯ 80%

$\frac{5}{8}$ ◯ $62\frac{1}{2}$ %   ◯ 40%   ◯ 65%

1. What value is missing in this problem:

   6 is 30% of what number?

   Percent   Total   Part

   ◯   ◯   ◯

2. What value is missing in this problem:

   3% of 150 is what number?

   Percent   Part   Total

   ◯   ◯   ◯

3. Bob has 20 books. 75% of them are mystery books. How many are mystery books?

   In this problem 20 books is the total. What value is missing?

   Total   Part   Percent

   ◯   ◯   ◯

4. Which is the correct way to write problem 2 in a formula?

   ◯ 20 is 75% of what number?

   ◯ What number is 75% of 20?

5. Mary had 6 cupcakes. She ate 2 of them. What percent did she eat?

   Which is the correct way to write this in a formula?

   ◯ What percent of 6 is 2?

   ◯ What percent of 2 is 6?

   ◯ What number is 2% of 6?

D-85

1. Jane had 15 hair ribbons. She gave 30% of them to her sister. How many ribbons did she give to her sister?

   What is missing in this problem?

Part	Percent	Total
⟠	⟠	⟠

2. What is the correct answer for the problem in question 1?

   ○ 5   ○ 10   ○ 45

3. To find the remaining percent when one percent is given _____ 100%.

add to	subtract from
⟠	⟠

4. John ate 80% of his dinner. What percent did he leave on his plate?

180%	200%	20%
⟠	⟠	⟠

5. What does the whole thing in any problem always equal?

   ⟠ Part + Total
   ⟠ 100%
   ⟠ don't know

D-282

A garden plot 60 ft. long and 40 ft. wide
was used to grow vegetables by a class
of 12 boys and 8 girls. Each student
was given the same amount of ground.

1. How many square feet in the garden?
   ○ 240   ○ 2400   ○ 1200

2. How many square feet did each student
   have?
   ○ 120   ○ 80   ○ 100

3. What part of the garden did the boys have
   ○ 3/5   ○ 2/5   ○ 3/4

A committee is planning on 72 boys and
girls attending a swimming party where
lemonade and hot dogs are going to be
served. One pint of lemonade and two
hot dogs are allowed each guest. If
lemonade costs 65¢ per gallon, hot dogs
59¢ per pound, and rolls 32¢ per dozen,
find the cost of the following:

4. the lemonade for the party (8 pts. = 1 gal.)
   ○ $4.85   ○ $5.85   ○ $5.35

5. the hot dogs (6 hot dogs per pound)
   ○ $14.16   ○ $14.56   ○ $13.16

6. the rolls (two per person)
   ○ $2.85   ○ $3.44   ○ $3.84

7. the total cost of the party
   ○ $22.85   ○ $23.85   ○ $23.75

D-68

1. Which is pi equal to?

   $\bigcirc \frac{7}{22}$ $\bigcirc \frac{22}{7}$

2. Which is the formula for the area of a circle?

   πr^2 $\bigcirc$ $2\pi r$ $\bigcirc$

3. What is the area of a circle whose radius is 3 inches?

   $\bigcirc$ 9.42 square inches
   $\bigcirc$ 28.26 square inches
   $\bigcirc$ 18.84 square inches

4. Is circumference given in <u>square</u> units?

   $\bigcirc$ Yes $\bigcirc$ No

5. Which is the formula for the circum-ference of a circle?

   $\bigcirc$ πr^2 $\bigcirc$ $2\pi r$

6. Is π equal to 3.14?
   $\bigcirc$ Yes $\bigcirc$ No

7. What is the distance around a circle?

   diameter   circumference   area
   $\bigcirc$ $\bigcirc$ $\bigcirc$

1. How long is the line above this ruler?
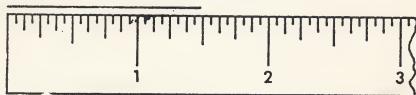
○ $1\frac{1}{2}$ in.   ○ $1\frac{8}{16}$ in.   ○ BOTH

2. To the nearest sixteenth inch, what is the length of the line above this ruler?
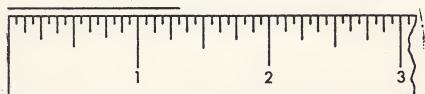
○ $1\frac{5}{16}$ in.   ○ $1\frac{3}{16}$ in.   ○ $1\frac{5}{8}$ in.

3. To the nearest eighth inch, what is the length of the line above this ruler?
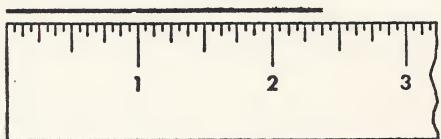
○ $2\frac{6}{16}$ in.   ○ $2\frac{3}{8}$ in.   ○ $2\frac{6}{8}$ in.

4. To the nearest eighth inch, what is the length of the line above this ruler?
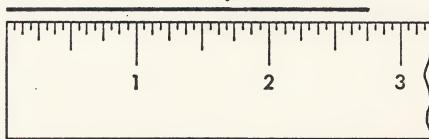
○ $2\frac{5}{8}$ in.   ○ $2\frac{3}{4}$ in.   ○ $2\frac{12}{16}$ in.

MATHEMATICS Mf
Fractions series

2

1. A fraction is one number over another number. The number above the fraction bar is called the numerator. Which of the following numbers are the numerators of these two fractions? $\frac{3}{5}$ $\frac{4}{7}$ (3, 5) (3, 4) (5, 7)

2. The number below the fraction bar is called the denominator of the fraction. Which pair of numbers are the denominators of these fractions? $\frac{2}{3}$ $\frac{5}{8}$ (5, 8) (2, 5) (3, 8)

3. To multiply the fractions, one-half times one-third, we first multiply their numerators - one times one. Then we multiply their denominators - two times three. One times one is one, and two times three is six. Then what is the correct answer?
$\frac{1}{6}$ $\frac{2}{5}$ $\frac{2}{6}$

4. One-half times one-third is the same as one-half of one-third. Let's divide a circle into thirds. Then take half of one-third and remove it from the circle. What part of the whole is it?
$\frac{1}{2}$ $\frac{1}{3}$ $\frac{1}{6}$
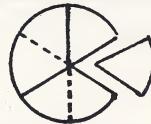
5. What is the product of one-half times one-fourth? $\frac{2}{6}$ $\frac{1}{8}$ $\frac{2}{8}$

6. One-half times one-fourth is the same as one-half of one-fourth. Divide a square into fourths. Then take half of one-fourth and remove it. Count the number of small parts the square has. What part of the whole square is the part that was removed?
$\frac{1}{8}$ $\frac{1}{4}$ $\frac{1}{2}$
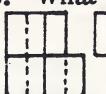
7. Multiply one-third times one-fourth. Remember to multiply their numerators together and their denominators together. What is the product? $\frac{2}{7}$ $\frac{2}{12}$ $\frac{1}{12}$

8. One-third times one-fourth is the same as one-third of one-fourth. This rectangle was divided into fourths, then each fourth was divided into three equal parts. One-third of one-fourth is what part of the whole rectangle?

$\dfrac{1}{3}$ $\dfrac{1}{12}$ $\dfrac{1}{4}$
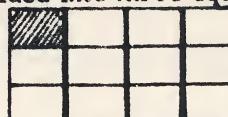
9. To find one-third of one-half we first divide a circle into halves, then take one-third of the right half and remove it. One-third of one-half is what part of the whole circle?

$\dfrac{1}{3}$ $\dfrac{1}{5}$ $\dfrac{1}{6}$

10. The circle on the left shows one-third of one-half. The circle on the right shows one-half of one-third. Is one-third of one-half the same as one-half of one-third? (yes) (no)

11. Study these two examples. Does the order in which we multiply fractions make a difference? (yes) (no)

$\dfrac{1}{3}$ x $\dfrac{1}{2}$ $=$ $\dfrac{1 \times 1}{3 \times 2}$ $=$ $\dfrac{1}{6}$

$\dfrac{1}{2}$ x $\dfrac{1}{3}$ $=$ $\dfrac{1 \times 1}{2 \times 3}$ $=$ $\dfrac{1}{6}$

12. Find the product of one-third times five-eighths. $\dfrac{6}{24}$ $\dfrac{5}{24}$ $\dfrac{6}{11}$

13. What is the product of one-half times three-fifths? $\dfrac{3}{10}$ $\dfrac{4}{7}$ $\dfrac{3}{7}$

14. Which answer do we get when we multiply four-sevenths times two-thirds?

$\dfrac{6}{10}$ $\dfrac{8}{21}$ $\dfrac{8}{18}$

15. Which product is correct for this example? $\dfrac{3}{8}$ x $\dfrac{5}{6}$ $=$?

$\dfrac{8}{14}$ $\dfrac{18}{48}$ $\dfrac{15}{48}$

16. Find the product of two-ninths times three-fourths. $\dfrac{6}{36}$ $\dfrac{5}{13}$ $\dfrac{8}{27}$

17. When we multiply the fraction two-fifths times the whole number 3, we write three as a fraction by putting it over one. Then we multiply. Finish multiplying two-fifths times three. What is the product? $\dfrac{6}{15}$ $\dfrac{5}{6}$ $\dfrac{6}{5}$

18. What is three-eighths times four? $\frac{7}{9}$ $\frac{12}{8}$ $\frac{7}{8}$

19. Find the product of four-sevenths times five by first writing five as five over one.
$\frac{20}{7}$ $\frac{9}{7}$ $\frac{9}{8}$

20. Think of two as two over one and multiply five-sixths times two. What is the product? $\frac{10}{12}$ $\frac{10}{6}$ $\frac{7}{6}$

21. When you multiply a fraction times a whole number, is the denominator of the product in each case the same as the denominator of the fraction? (yes) (no)

22. When you multiply a fraction times a whole number, is the numerator of each product the result of multiplying the numerator of the fraction times the whole number? (yes) (no)

23. We know that two halves equal one whole. We write this two over two equals one. Any number over the same number equals one. Which fraction is equal to one whole?
$\frac{2}{3}$ $\frac{3}{4}$ $\frac{3}{3}$

24. Which of these fractions is not equal to one? $\frac{5}{5}$ $\frac{6}{7}$ $\frac{4}{4}$

25. We know that multiplying any whole number times one does not change its value. Let's multiply a fraction by another fraction equal to one. What is one-third times two over two? $\frac{4}{3}$ $\frac{2}{5}$ $\frac{2}{6}$

26. One-third of one circle is shaded and two-sixths of the other. Is the same amount of both circles shaded? (yes) (no)

27. What is the product of one-half times four over four? $\frac{3}{8}$ $\frac{4}{8}$ $\frac{5}{6}$

28. One-half of one square is shaded and four-eighths of the other. Is the same amount of both squares shaded? (yes) (no)

29. What is one-fourth times three over three? $\frac{9}{12}$ $\frac{4}{7}$ $\frac{3}{12}$

30. One-fourth of one rectangle is shaded and three-twelfths of the other. Is the same amount of both rectangles shaded? (yes) (no)
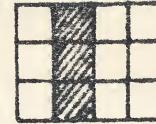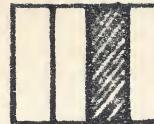
31. What is two-thirds times six over six? $\frac{12}{9}$ $\frac{8}{9}$ $\frac{12}{18}$

32. Is two-thirds equal to twelve-eighteenths? (yes) (no)

33. Multiply four-sevenths times five-fifths. What is the answer? $\frac{9}{35}$ $\frac{20}{35}$ $\frac{9}{12}$

34. Here is the multiplication of the last problem. Did we change the value of four-sevenths when we multiplied by five over five to get twenty thirty-fifths? (yes) (no)

$$\frac{4}{7} \times \frac{5}{5} = \frac{4 \times 5}{7 \times 5} = \frac{20}{35}$$

35. Which of these fractions should we multiply five-eighths by to keep the value the same? $\frac{2}{3}$ $\frac{3}{3}$ $\frac{3}{4}$

36. Multiply five-eighths times three over three. Which is the product?
$\frac{8}{11}$ $\frac{8}{24}$ $\frac{15}{24}$

37. Is five-eighths equal in value to 15 twenty-fourths? (yes) (no)

38. Which of these fractions would you not multiply by if you wanted to keep the value of a fraction the same? $\frac{2}{2}$ $\frac{2}{3}$ $\frac{3}{3}$

39. Compare the shaded parts of these two circles. Three-fourths is equal to how many eighths? $\frac{4}{8}$ $\frac{5}{8}$ $\frac{6}{8}$
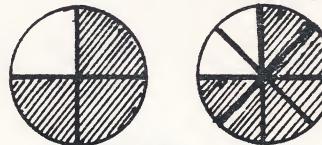
40. Look at this picture. It shows one-half of three-fourths is removed. Is this removed part three-eighths? (yes) (no)
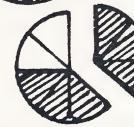
41. Which fraction is the product of one-half times three-fourths? $\frac{4}{6}$ $\frac{4}{8}$ $\frac{3}{8}$

42. Look at the shaded parts of these two rectangles. Three-fifths is equal to how many tenths? $\frac{5}{10}$ $\frac{6}{10}$ $\frac{7}{10}$
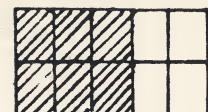
43. The double shaded part of this rectangle shows one-half of three-fifths. What part of the whole rectangle is the double shaded part? $\frac{3}{10}$ $\frac{4}{10}$ $\frac{1}{5}$
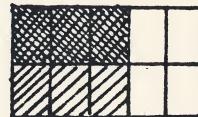
44. What is the product when one-half is multiplied by three-fifths? $\frac{3}{5}$ $\frac{3}{10}$ $\frac{4}{7}$

45. The shaded parts of these two rectangles are equal. Then two-thirds is equal to how many twelfths? $\frac{6}{12}$ $\frac{7}{12}$ $\frac{8}{12}$
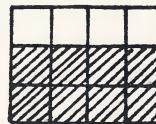
46. What is two-thirds times four over four? $\frac{7}{12}$ $\frac{8}{12}$ $\frac{6}{12}$

47. The double shaded part of this rectangle is one-fourth of two-thirds. What part of the whole rectangle is it? $\frac{1}{12}$ $\frac{4}{6}$ $\frac{2}{12}$
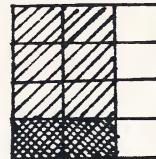
48. Which is the product of one-fourth times two-thirds? $\frac{2}{12}$ $\frac{3}{7}$ $\frac{3}{12}$

49. Complete this sentence. "When we multiply two fractions, we _____ their numerators to get the numerator of the product and _____ their denominators to get the denominator of the product. (add) (multiply) (subtract)

1. Multiplying any fraction by one (or a fraction equal to one) results in a fraction with the same value. For example, three-fourths times two over two equals six-eighths. Three-fourths is equivalent to six-eighths. Two-thirds times which of these fractions results in a fraction with the same value as two-thirds? $\frac{3}{4}$ $\frac{3}{2}$ $\frac{4}{4}$

2. The product of two-thirds times four over four is eight-twelfths. Does two-thirds equal eight-twelfths? (yes) (no)

3. What is the product of three-fifths times two over two? $\frac{5}{10}$ $\frac{6}{10}$ $\frac{5}{7}$

4. When we multiply the numerator and denominator of any fraction by the same number, does the value of the fraction remain the same or change? (same) (changed)

5. The value remains the same when we divide the numerator and denominator of a fraction by the same number. When we divide the numerator and denominator of six-eighths by two, we get three-fourths. Six-eighths is equivalent to three-fourths. What fraction results when we divide the numerator and denominator of eight-twelfths by four? $\frac{4}{3}$ $\frac{2}{4}$ $\frac{2}{3}$

6. Is eight-twelfths equivalent to two-thirds? (yes) (no)

7. What number do we divide the numerator and denominator of six-tenths by to get three-fifths? (5) (2) (3)

8. Does six-tenths equal three-fifths? (yes) (no)

9. Which fraction should we multiply two-sevenths by to get an equivalent fraction with 21 in the denominator? $\frac{2}{3}$ $\frac{3}{4}$ $\frac{3}{3}$

10. Two-sevenths is equivalent to 6 over 21. What number should the numerator and denominator be divided by to get the equivalent fraction two-sevenths? (5) (3) (4)

11. The division process is called reducing. When we divide the numerator and denominator of six-twelfths by two, does the resulting fraction have the same value as six-twelfths? (yes) (no)

12. What number can both the numerator and denominator of three-sixths be divided by? (2) (4) (3)

13. What is the result of three-sixths divided by three over three? $\dfrac{2}{3}$ $\dfrac{1}{2}$ $\dfrac{1}{3}$

14. We divide the numerator and denominator of six-twelfths by two to get the equivalent fraction three-sixths. Then we divide three-sixths by three to get one-half. If we divide the numerator and denominator of six-twelfths by six, do we also get one-half? (yes) (no)

15. By dividing by two and then by three, or by dividing by six, we find six-twelfths is equivalent to one-half. And because there is no number that will divide into the numerator and denominator of one-half, we say we have reduced six-twelfths to lowest terms. What number should we divide the numerator and denominator of eight-sixteenths by to reduce it to lowest terms? (4) (8) (16)

16. Would dividing eight-sixteenths by two, three times, give the same result as dividing eight-sixteenths by eight? (yes) (no)

17. What is the product of two-thirds times one-fourth? $\dfrac{3}{7}$ $\dfrac{2}{6}$ $\dfrac{2}{12}$

18. What is the result when the numerator and denominator of two-twelfths are divided by two? $\dfrac{1}{10}$ $\dfrac{1}{6}$ $\dfrac{1}{4}$

19. A short cut in multiplying fractions is first to divide a numerator and a denominator by the same number, then multiply the remaining factors. In this example we divided the numerator of the first fraction, two, by two which is one. Then we divided the denominator of the second fraction, four, by two also. Four divided by two is two. Now multiply the remaining factors. What is the product?

$\dfrac{1}{6}$ $\dfrac{2}{5}$ $\dfrac{2}{6}$

1st Fraction		2nd Fraction
$\dfrac{^1\cancel{2}}{3}$	x	$\dfrac{1}{\cancel{4}_2}$

$$\frac{1 \ \text{x} \ 1}{3 \ \text{x} \ 2} = \ ?$$

20. Find the product of four-fifths times one-sixth. $\frac{4}{15}$ $\frac{4}{30}$ $\frac{5}{11}$

21. The product of four-fifths times one-sixth is four over thirty. What is this answer <u>reduced</u> to lowest terms? $\frac{4}{3}$ $\frac{1}{3}$ $\frac{2}{15}$

22. We have divided the numerator of the first fraction by two and the denominator of the second fraction by two. What is the product? $\frac{2}{15}$ $\frac{3}{8}$ $\frac{2}{11}$

$$\frac{\overset{2}{\cancel{4}}}{5} \quad x \quad \frac{1}{\underset{3}{\cancel{6}}} \qquad \frac{2 \ x \ 1}{5 \ x \ 3} = \ ?$$

23. Divide the numerator of the first fraction by three and the denominator of the second fraction by three also. Then multiply. What is the result? $\frac{6}{10}$ $\frac{5}{10}$ $\frac{5}{16}$

$$\frac{3}{8} \quad x \quad \frac{5}{6}$$

24. Divide the denominator of the first fraction and the numerator of the second fraction by two. Then multiply and find the product. $\frac{3}{7}$ $\frac{3}{10}$ $\frac{4}{7}$

$$\frac{3}{4} \quad x \quad \frac{2}{5}$$

25. Multiply these two fractions, then reduce by dividing numerator and denominator by two. $\frac{9}{13}$ $\frac{20}{28}$ $\frac{10}{21}$

$$\frac{5}{6} \quad x \quad \frac{4}{7}$$

26. This time divide the denominator of the first and the numerator of the second fraction by two, then multiply. $\frac{10}{28}$ $\frac{10}{21}$ $\frac{7}{10}$

$$\frac{5}{6} \quad x \quad \frac{4}{7}$$

27. Compare the two ways of getting the product of these two fractions. The second method is called a shortcut. Are the two answers the same? (yes) (no)

(1) $\frac{5}{6} \ x \ \frac{4}{7} = \frac{20 \div 2}{42 \div 2} = \frac{10}{21}$ (2) $\frac{5}{\underset{3}{\cancel{6}}} \ x \ \frac{\overset{2}{\cancel{4}}}{7} = \frac{5 \ x \ 2}{3 \ x \ 7} = \frac{10}{21}$

28. Using slash marks we have divided the numerator of the first fraction and the denominator of the second by three. Then using slash marks again we've divided

the denominator of the first and the numerator of the second by two. Find the product of the remaining factors. $\frac{2}{4}$ $\frac{1}{4}$ $\frac{2}{5}$

$$\frac{1\cancel{2}}{4\cancel{8}} \times \frac{\cancel{2}^{1}}{\cancel{3}_{1}} \qquad \frac{1 \times 1}{4 \times 1} = \ ?$$

29. Now multiply the same two fractions above without cancelling. What is the product?

$\frac{6}{21}$ $\frac{5}{11}$ $\frac{6}{24}$

30. Reduce this fraction to lowest terms by dividing numerator and denominator by six.

$\frac{1}{4}$ $\frac{1}{3}$ $\frac{1}{8}$

$$\frac{6 \div 6}{24 \div 6} = \ ?$$

31. Which of these methods is called a shortcut?

(1) $\dfrac{1\cancel{2}}{4\cancel{8}} \times \dfrac{\cancel{2}^{1}}{\cancel{3}_{1}} = \dfrac{1 \times 1}{4 \times 1} = \dfrac{1}{4}$

(2) $\dfrac{3}{8} \times \dfrac{2}{3} = \dfrac{6 \div 6}{24 \div 6} = \dfrac{1}{4}$

32. Try the shortcut on this multiplication problem and find the product. $\frac{1}{4}$ $\frac{1}{6}$ $\frac{2}{12}$

$$\frac{2}{9} \times \frac{3}{4}$$

33. Multiply two-ninths times three-fourths without cancelling. What number should we divide numerator and denominator by to reduce it to lowest terms? (6) (12) (4)

34. When we multiply a fraction times a whole number, we think of the whole number as a fraction with one in the denominator. So five-eighths times four equals five-eighths times four over one or twenty eighths. Twenty-eighths reduced to lowest terms is five-halves. Which of these is the correct way to use the multiplication shortcut?

$$\frac{5}{4\cancel{8}} \times \frac{\cancel{4}^{2}}{1} \qquad \frac{5}{2\cancel{8}} \times \frac{\cancel{4}^{1}}{1}$$

35. What is four-ninths times three? Use the short cut. $\frac{1}{9}$ $\frac{4}{3}$ $\frac{12}{3}$

36. Pairs of numbers whose product equals one are called reciprocals. Are one-fourth and four reciprocals? (yes) (no)

37. What is the reciprocal of one-fifth? (3) (5) (4)

38. What is the reciprocal of three? $\frac{1}{6}$ 3 $\frac{1}{3}$

39. Is the product of two-sevenths times seven over two equal to one? (yes) (no)

40. What is the reciprocal of three-eighths?   (8) (3) $\frac{8}{3}$

41. When we multiply three-eighths times eight over three and use the multiplication shortcut, the remaining factors are all one. Using the long method, we get twenty-four over twenty-four. Does it also equal one? (yes) (no)

42. What is the reciprocal of six-fifths? $\frac{5}{3}$ $\frac{5}{6}$ $\frac{6}{5}$

43. Which pair of numbers are reciprocals? $\frac{2}{3}$ $\frac{1}{3}$ 6 $\frac{1}{6}$

44. Which of these pairs of numbers are reciprocals? $\frac{5}{8}$ $\frac{1}{8}$ $\frac{4}{9}$ $\frac{9}{4}$ $\frac{3}{4}$ $\frac{4}{1}$

45. Finish this statement with the correct word. "Pairs of numbers whose product equals one are called _____." (reciprocals) (reverses)

46. Complete this sentence correctly. "Multiplying the numerator and denominator of a fraction by the same number _____ change the value of the fraction." (does) (does not)

47. What word completes this sentence? "To reduce a fraction to its lowest terms, we _____ the numerator and denominator by the largest common factor." (divide) (multiply)

48. When you use either of these two methods, do you get the same answer? (yes) (no)

   (1) $\frac{3}{4}$ x $\frac{8}{9}$ = $\frac{24}{36}$ ÷ $\frac{12}{12}$ = $\frac{2}{3}$ (2) $\frac{1\cancel{3}}{1\cancel{4}}$ x $\frac{\cancel{8}^2}{3\cancel{9}}$ = $\frac{1 \times 2}{1 \times 3}$ = $\frac{2}{3}$

49. What is the reciprocal of five-twelfths?   12 $\frac{12}{5}$ $\frac{5}{10}$

MATHEMATICS Mf

Fractions series

5

1. When we divide the numerator and denominator of the fraction five-20ths by five over five, we do not change its value. The result is one-fourth. What is the result if we divide eight-twelfths by four over four? $\frac{32}{48}$ $\frac{4}{8}$ $\frac{2}{3}$

2. What fraction is this equal to? $\frac{6}{12}$ $\frac{1}{3}$ $\frac{9}{27}$ $\frac{3 \div 3}{9 \div 3}$ = ?

3. Which of these is ten-20ths equal to? $\frac{3}{5}$ $\frac{1}{2}$

4. When you divide both the numerator and denominator of a fraction by a number, it is called reducing the fraction to lower terms. Eight-sixteenths is reduced to one-half by dividing both the numerator and denominator by 8. What number is used to reduce twelve-ninths to four-thirds?   (6) (8) (3)

5. Is this fraction reduced correctly? (yes) (no) $\frac{10 \div 2}{12 \div 3}$ = $\frac{5}{4}$

6. Which of these is the correct way to reduce the fraction two-fourths?

   $\frac{2 \div 2}{4 \div 2}$ $\frac{2 \div 2}{4 \div 4}$ $\frac{2 \times 2}{4 \div 2}$

7. We can divide by two to reduce twelve-sixteenths to six-eighths and again to three-fourths. Can three-fourths be reduced any further? (yes) (no)

8. Which of these fractions is in the lowest terms? $\frac{12}{48}$ $\frac{6}{24}$ $\frac{1}{4}$

9. To reduce a fraction to its lowest terms, we divide by the largest number we can. Twelve-20ths can be divided by two over two or by four over four. Which one will reduce it to the lowest terms? (two over two) (four over four)

10. Twenty-four 28ths can be reduced to twelve-fourteenths by dividing each number by two. It can also be reduced to six-sevenths by dividing by four over four. Which reduced it to lowest terms? (two over two) (four over four)

11. To reduce a fraction to its lowest terms, do you divide by the smallest or the largest number you can? (smallest) (largest)

12. Which is the largest number that will divide into both 8 and 40? (2) (8) (4)

13. What is the largest number that will divide into both 75 and 100? (25) (5) (50)

14. To find the largest number that will divide into both 18 and 30, write the factors of each number. 1, 2, 3, 6, 9, and 18 are all the numbers that divide into 18. 1, 2, 3, 5, 6, 10, 15, and 30 are all the numbers that divide into 30. The numbers 1, 2, 3, and 6 are all factors of both 18 and 30. Which is the largest number that is a factor of both 18 and 30? (2) (6) (3)

15. What is the largest factor common to 24 and 28? (4) (2) (1)

16. Is five a common factor of 10 and 16? (yes) (no)

17. What is the largest common factor that you can divide thirty-six 48ths by to reduce it to its lowest terms? (4) (12) (6)

18. Reduce eighteen-twelfths to lowest terms. $\frac{3}{2}$ $\frac{9}{6}$ $\frac{6}{4}$

19. We can reduce a fraction in one step by choosing the largest common factor; for eight-sixteenths it is 8. Or we can reduce it in several steps, dividing first by four over four and then by two over two. Are the results the same? (yes) (no)

20. Reduce twelve-eighteenths on your paper two ways. First, divide by two over two and by three over three. Second, reduce twelve-eighteenths by dividing by six over six. Are the results equal? (yes) (no)

21. To keep the value the same, is it necessary to divide the numerator and denominator of a fraction by the same number? (yes) (no)

22. When you invert a fraction, you turn it upside down. What is one-half inverted?
$\frac{1}{2}$ $\frac{2}{1}$

23. What is five-ninths inverted? $\frac{9}{5}$ $\frac{5}{9}$

24. To divide one fraction by another fraction, like one-half divided by five-ninths, invert the divisor and multiply. Five-ninths is the divisor and it is inverted to nine-fifths. Is the divisor the fraction to the left of the division sign or the one to the right? (left) (right)

25. After you invert the divisor in the problem one-half divided by five-ninths, multiply the two fractions. What is the answer? $\frac{9}{10}$ $\frac{10}{7}$

26. To divide three-sevenths by one-half, first invert the divisor. One-half becomes two over one. Next, do you multiply or divide? (multiply) (divide)

27. Find the answer to three-sevenths divided by one-half. $\frac{5}{7}$ $\frac{6}{7}$ $\frac{5}{8}$

28. In the problem four-fifths divided by five-thirds, which fraction is the divisor? $\frac{4}{5}$ $\frac{5}{3}$

29. In the same problem, four-fifths divided by five-thirds, invert the divisor and multiply. What is the answer? $\frac{7}{25}$ $\frac{12}{25}$ $\frac{7}{10}$

30. Which is the correct way to solve the problem one-fourth divided by one-half?

$\frac{1}{4} \times \frac{1}{2}$ $\qquad$ $\frac{1}{4} \div \frac{2}{1}$ $\qquad$ $\frac{1}{4} \times \frac{2}{1}$

31. Invert the divisor in the problem one-fourth divided by one over two and multiply. What is the answer? $\frac{2}{4}$ $\frac{3}{5}$ $\frac{2}{5}$

32. Complete this sentence with the correct words. "To divide a fraction by a fraction, invert the _____ and _____." (divisor, multiply) (divisor, divide)

33. When we have a divisor which is a whole number, such as five, we treat it as the fraction five over one. What do we get when we invert five over one? $\frac{1}{5}$ $\frac{0}{5}$

34. Find the results of two-fifths times one-fifth. $\frac{2}{10}$ $\frac{3}{10}$ $\frac{2}{25}$

35. In this problem think of four as four over one. What is it after it is inverted? $\frac{4}{0}$ $\frac{1}{4}$ 4

$\frac{3}{4}$ $\div$ 4

36. Now multiply three-fourths times one-fourth. What is the correct answer?

$\frac{4}{8}$ $\frac{3}{16}$ $\frac{4}{16}$

37. How do you write the whole number "9" as a fraction? $\frac{9}{1}$ $\frac{9}{0}$ $\frac{1}{9}$

38. Invert nine over one. Which fraction is correct? $\frac{9}{0}$ $\frac{0}{9}$ $\frac{1}{9}$

39. Which is the correct way to invert the divisor and multiply in the problem four-21sts divided by one-fifth? $\frac{4}{21} \times \frac{1}{5}$ $\frac{4}{21} \times \frac{5}{1}$

40. Divide five-elevenths by one-half. Which answer is correct? $\frac{10}{11}$ $\frac{7}{12}$ $\frac{5}{22}$

41. Which is the correct way to solve this problem? $\frac{1}{4} \div \frac{1}{3}$

   (1) $\frac{1}{4} \div \frac{3}{1}$ (2) $\frac{1}{4} \times \frac{3}{1}$ (3) $\frac{4}{1} \times \frac{1}{3}$

42. Which fraction is the divisor in this problem? $\frac{1}{2} \div \frac{1}{3}$

   (1) $\frac{1}{2}$ (2) $\frac{1}{3}$

MATHEMATICS Mf

Fractions   series

6

1. Which number in the fraction two-thirds is smaller: the number in the numerator or the one in the denominator? (numerator) (denominator)

2. If a fraction has a smaller numerator than denominator, it is called a proper fraction. Since two is smaller than three, two-thirds is a proper fraction. Is six-tenths also a proper fraction? (yes) (no)

3. Which of these is a proper fraction? $\dfrac{12}{11}$ $\dfrac{1}{2}$ $\dfrac{3}{1}$

4. Choose the proper fraction here. $\dfrac{9}{4}$ $\dfrac{4}{1}$ $\dfrac{1}{4}$

5. Which of these is not a proper fraction? $\dfrac{11}{12}$ $\dfrac{36}{70}$ $\dfrac{20}{5}$

6. In a proper fraction which is smaller: the numerator or the denominator? (numerator) (denominator)

7. If the numerator is equal to the denominator, like four-fourths, or if it is larger than the denominator, like seven-sixths, the fraction is called an improper fraction. Is fifteen-fourteenths an improper fraction? (yes) (no)

8. Which of these is an improper fraction? $\dfrac{16}{17}$ $\dfrac{21}{20}$ $\dfrac{19}{30}$

9. Choose the improper fraction. $\dfrac{20}{30}$ $\dfrac{60}{40}$ $\dfrac{75}{100}$

10. Which kind of fractions are these? (proper) (improper) $\dfrac{3}{4}$ $\dfrac{7}{12}$

11. Which kind is this?   (proper) (improper) $\dfrac{4}{4}$

12. An improper fraction should be changed to a mixed number. Since the fraction bar means divided by, we divide the numerator by the denominator. How much is four divided by three?

$$1\frac{1}{3} \qquad \frac{3}{4}$$

13. Is one and one-third an improper fraction or a mixed number? (improper fraction) (mixed number)

14. Change nine-fourths to a mixed number by dividing nine by four. $\quad 3\frac{3}{4} \qquad 2\frac{1}{4}$

15. What does the fraction bar mean? (divide the numerator by the denominator) (divide the denominator by the numerator)

16. Change twenty-thirds to a mixed number by dividing 20 by three.

$$5\frac{4}{5} \qquad 6\frac{2}{3} \qquad \frac{7}{1}$$

17. Change the improper fraction, forty-one halves, to a mixed number.

$$20\frac{1}{2} \qquad \frac{10}{1} \qquad 20\frac{1}{3}$$

18. Now divide six-fifths. Which of these is it equal to? $\quad 1\frac{1}{5} \qquad \frac{1}{6}$

19. Is seven-thirds equal to two and one-third? (yes) (no)

20. Which kind of fractions do you change to mixed numbers? (proper fractions) (improper fractions)

21. Let's change the mixed number, two and one-fourth, back to an improper fraction. Multiply the whole number, two, times the number in the denominator, four, then add the numerator, one. Put the sum over the denominator, four. Is nine-fourths the correct answer? (yes) (no)

22. Now change six and two-thirds to an improper fraction. Multiply the whole number, six, times the denominator, three, and add the numerator, two. Put the sum over the denominator. Which of these is correct? $\quad \frac{12}{3} \qquad \frac{20}{3}$

23. To change four and one-half to nine-halves, which number is missing in the formula?
(4) (1) (2)

$$4\frac{1}{2} \;=\; \frac{4 \times (2) + ?}{2} \;=\; \frac{9}{2}$$

24. We multiplied the whole number, four, times the denominator, two, and added the numerator, one. Then we put the sum over the denominator, two. Nine-halves is correct. Which number is missing in this formula to change three and two-fifths to an improper fraction?   (3) (2) (5)

$$3\frac{2}{5} = \frac{3 \times (?) + 2}{5}$$

25. Follow the steps to find the correct improper fraction. $\frac{17}{5}$ $\frac{11}{5}$ $\frac{13}{5}$

$$3\frac{2}{5} = \frac{3 \times (5) + 2}{5} = ?$$

26. Change one and one-half to an improper fraction. $\frac{3}{2}$ $\frac{4}{2}$ $\frac{2}{2}$

27. Find the improper fraction for five and three-fourths on your paper. $\frac{17}{4}$ $\frac{23}{4}$ $\frac{35}{4}$

28. What is twenty-three divided by four equal to? $5\frac{3}{4}$ $6\frac{1}{4}$

29. We found one and one-half to equal three-halves. To check, divide three by two. Is it equal to one and one-half? (yes) (no)

30. We found two and one-fourth to equal nine-fourths. To check the work, divide nine by four. Is it equal to two and one-fourth? (yes) (no)

MATHEMATICS Mf
Fractions series

1. A mixed number has two parts: the whole number and the fraction. Which number is a mixed number?   3.5 $7\frac{1}{4}$ $\frac{1}{12}$

2. In the last lesson you learned how to change a mixed number to an improper fraction. Let's change two and one-fourth again. First, you multiply the whole number, two, times the number in the denominator, four, then add the numerator, one. Put the sum over the denominator, four. Which of these is the correct answer?
$\frac{9}{4}$ $\frac{6}{4}$ $\frac{10}{4}$

3. To change three and one-half to seven halves, which number is missing in the formula?   (3) (2) (1)
$$3\frac{1}{2} = \frac{3 \times (2) + ?}{2} = \frac{7}{2}$$

4. We multiplied the whole number, three, times the denominator, two, and added the numerator, one. Then we put the sum over the denominator, two. Which number is missing in the formula below to change five and three-tenths to an improper fraction? (10) (3) (5)
$$5\frac{3}{10} = \frac{5 \times (10) + 3}{?}$$

5. Change this mixed number to an improper fraction. $4\frac{1}{4}$

$\frac{20}{4}$ $\frac{17}{4}$ $\frac{20}{1}$

6. Change one and one-half to an improper fraction on your paper. $\frac{4}{2}$ $\frac{5}{1}$ $\frac{3}{2}$

7. To multiply a mixed number, like one and one-half, by a fraction, like one-fourth, the first step is to change one and one-half to an improper fraction. Which one did we find correct in question number 6? $\frac{3}{2}$ $\frac{2}{3}$

8. One and one-half is equal to three-halves. Now we can multiply the two fractions: three halves times one-fourth. Multiply the numerators, three times one, then multiply denominators, two times four. Which answer is correct? $\dfrac{4}{6}$ $\dfrac{3}{8}$

9. To multiply two and one-fourth times one-third, change the mixed number to an improper fraction. Which of these is two and one-fourth equal to? $\dfrac{10}{2}$ $\dfrac{9}{4}$ $\dfrac{12}{1}$

10. Multiply the fraction nine-fourths times one-third. What is the answer?
$\dfrac{9}{12}$ $\dfrac{27}{4}$ $\dfrac{10}{7}$

11. When you multiply a mixed number by a fraction, what is the first step? (change the mixed number to a fraction) (change the fraction to a mixed number)

12. Change three and one-half to an improper fraction. Then multiply it by five-sixths. Which is the correct answer? $\dfrac{25}{10}$ $\dfrac{35}{12}$ $\dfrac{42}{10}$

13. Change one and three-tenths to an improper fraction. Then multiply it by three-fifths. $\dfrac{9}{50}$ $\dfrac{30}{15}$ $\dfrac{39}{50}$

14. Solve this problem. What is the answer? $\dfrac{42}{6}$ $\dfrac{28}{9}$ $\dfrac{16}{6}$

$$4\dfrac{2}{3} \quad \times \quad \dfrac{2}{3} \quad = \quad ?$$

15. Find the correct answer to this problem. $\dfrac{36}{20}$ $\dfrac{27}{20}$ $\dfrac{12}{9}$

$$2\dfrac{2}{5} \quad \times \quad \dfrac{3}{4} \quad = \quad ?$$

16. What is two and three-sevenths equal to? $\dfrac{17}{7}$ $\dfrac{13}{7}$

17. You learned that to divide two fractions you invert the divisor and multiply. Which fraction is the divisor in this problem? $\dfrac{17}{7}$ $\dfrac{1}{2}$

$$\dfrac{17}{7} \div \dfrac{1}{2}$$

18. What is one-half inverted? $\dfrac{2}{1}$ $\dfrac{1}{2}$

19. Multiply seventeen-sevenths times two over one. Which answer is correct?

$$\frac{17}{14} \qquad \frac{34}{7} \qquad \frac{19}{8}$$

20. To divide one and two-thirds by three-fourths, first change the mixed number to an improper fraction. Which of these is the correct answer? $\frac{5}{3} \qquad \frac{8}{3} \qquad \frac{6}{3}$

$$1\frac{2}{3} \quad = \quad ? \quad \text{(Improper fraction)}$$

21. Which shows the correct way to invert the divisor and multiply? $\frac{3}{5} \text{ x } \frac{3}{4} \qquad \frac{5}{3} \text{ x } \frac{4}{3}$

$$\frac{5}{3} \quad \div \quad \frac{3}{4}$$

22. Multiply these fractions on your paper. Which is the correct answer?

$$\frac{15}{12} \qquad \frac{20}{9} \qquad \frac{9}{6} \qquad\qquad \frac{5}{3} \text{ x } \frac{4}{3} = ?$$

23. What is the first step in solving this division problem?   A. Change two and one-third to seven-thirds   B. Invert two over three to three over two
C. Change the division sign to times sign   (A) (B) (C)

$$2\frac{1}{3} \quad \div \quad \frac{2}{3}$$

24. Now use paper to solve the problem in question number 23. What is the correct answer? $\frac{14}{9} \qquad \frac{10}{5} \qquad \frac{21}{6}$

25. Follow the steps on paper to solve this problem. Remember to invert the divisor and multiply. Find the correct answer. $\frac{11}{24} \qquad \frac{44}{6} \qquad \frac{12}{10}$

$$1\frac{5}{6} \quad \div \quad \frac{1}{4} = ?$$

26. Find the correct answer for this problem. $\frac{27}{2} \qquad \frac{9}{6} \qquad \frac{12}{3}$

$$4\frac{1}{2} \quad \div \quad \frac{1}{3} = ?$$

27. What is the answer to this division problem? $\frac{98}{20}$ $\frac{72}{35}$ $\frac{126}{20}$

$$3\frac{3}{5} \ \div \ \frac{4}{7} \ = \ ?$$

MATHEMATICS Mf
Fractions series
8

1. Like Fractions have the same number in their denominators. One-eighth and five-eighths both have eight for denominators. They are called Like Fractions. Are one-sixth and three-sixths Like Fractions? (yes) (no)

2. Are two-fourths and three-fourths Like Fractions? (yes) (no)

3. Are three-ninths and nine-thirds Like Fractions? (yes) (no)

4. Three-ninths and nine-thirds are called Unlike Fractions. They do not have the same number in their denominators. Are two-eighths and three-ninths Unlike Fractions? (yes) (no)

5. Which pair of fractions are the Unlike Fractions? $\dfrac{11}{3}$ $\dfrac{19}{3}$ $\dfrac{4}{11}$ $\dfrac{11}{3}$

6. Which kind of fractions are these? (Like) (Unlike)

$\dfrac{1}{7}$ $\dfrac{7}{1}$

7. Which of these are Like Fractions? $\dfrac{1}{2}$ $\dfrac{3}{2}$ $\dfrac{3}{4}$ $\dfrac{2}{3}$

8. Like Fractions can be added. Add the numerators together, one plus two, and put the sum, three, over the same denominator, two. One-half plus two-halves equal three-halves. How much is three-fourths plus five-fourths? $\dfrac{2}{4}$ $\dfrac{8}{4}$

9. How much is seven-eighths plus four-eighths? $\dfrac{28}{8}$ $\dfrac{11}{8}$ $\dfrac{3}{8}$

10. What is the sum of seven-twelfths and eight-twelfths? $\dfrac{15}{12}$ $\dfrac{1}{12}$ $\dfrac{56}{24}$

11. Like Fractions can also be subtracted. Two-fourths minus one-fourth equals one-fourth. Subtract the numerators, two minus one, and put the difference, one, over the same denominator, four. What is five-sixths minus two-sixths? $\frac{7}{6}$ $\frac{3}{6}$

12. Subtract eight-tenths minus three-tenths. $\frac{5}{10}$ $\frac{11}{10}$ $\frac{24}{10}$

13. What is the correct answer if you subtract four-ninths from six-ninths?
$\frac{10}{9}$ $\frac{2}{9}$ $\frac{24}{9}$

14. Fill in the blanks in this sentence with the correct pair of words. "To subtract Like Fractions, subtract the _____ and put the difference over the same _____."
(numerators, denominator) (denominators, numerator)

15. Do the fractions one-fourth and one-third have the same denominators? (yes) (no)

16. To add two Unlike Fractions, such as one-fourth plus one-third, we must first find a common denominator. Which number is a common denominator for these two fractions? (7) (12)

17. For Unlike Fractions we multiply the denominators, four times three. Then we use 12 as the common denominator for the two new fractions. Will these new fractions be Like or Unlike Fractions? (Like) (Unlike)

18. What number is a common denominator for these two Unlike Fractions? (7) (10) (3)

$$\frac{1}{5} + \frac{1}{2}$$

19. Choose a number that can be used as a common denominator for these two Unlike Fractions. (5) (6) (8)

$$\frac{1}{2} + \frac{2}{3}$$

20. Six is the common denominator for the Unlike Fractions one-half and two-thirds. Now we need to change one-half to sixths. What number should we multiply both the numerator and denominator of one-half by to get sixths? (3) (4)

21. Two times three is six. Then one-half is equal to how many sixths? $\frac{4}{6}$ $\frac{3}{6}$

22. Let's change two-thirds to sixths. What number should we multiply by? (6) (2) (3)

23. Did we change the value of the fraction when we multiplied both the numerator and denominator by two? (yes) (no)

24. Now we can add the two Like Fractions three-sixths and four-sixths. Which answer is correct? $\frac{7}{6}$ $\frac{1}{6}$ $\frac{12}{6}$

25. We need to change these two Unlike Fractions, four-thirds and one-half, to two Like Fractions with the same denominator, six. Which of these numbers are correct for the numerators of the Like Fractions? (3, 2) (8, 3)

26. Four-thirds plus one-half are equal in value to eight-sixths plus three-sixths. Add the two Like Fractions, eight-sixths and three-sixths. What is the correct sum? $\frac{11}{6}$ $\frac{24}{6}$ $\frac{5}{6}$

27. These Unlike Fractions, three-fourths and one-third, need a common denominator. Which one is correct? (7) (12) (9)

28. Change the numerators of the Unlike Fractions, three-fourths and one-third, to Like Fractions with 12 in the denominators. Which of these numbers should be the numerators? (9, 4) (8, 6)

29. Add these Like Fractions. What is the sum? $\frac{3}{12}$ $\frac{13}{12}$ $\frac{17}{12}$

$$\frac{9}{12} + \frac{4}{12} = ?$$

30. These Unlike Fractions need a common denominator. Which one is correct? (11) (24)

$$\frac{5}{3} + \frac{5}{8}$$

31. Which numbers should be the numerators of the Like Fractions? (40, 15) (15, 15)

Unlike: $\frac{5}{3} + \frac{5}{8}$ Like: $\frac{?}{24} + \frac{?}{24}$

32. What is the sum of these two Like Fractions? $\frac{55}{24}$ $\frac{55}{48}$

$$\frac{40}{24} + \frac{15}{24} = ?$$

33. Which pair of fractions do not need new denominators before they can be added?

$$\frac{2}{9} + \frac{5}{9} \qquad \frac{5}{7} + \frac{1}{4}$$

34. Which of these fractions do need new denominators before they are added?

$$\frac{2}{5} + \frac{3}{5} \qquad \frac{6}{8} + \frac{2}{4}$$

35. These Like Fractions have the same denominators and can be subtracted. Which answer is correct? $\quad \frac{2}{10} \quad \frac{6}{10} \quad \frac{8}{10}$

$$\frac{4}{10} - \frac{2}{10} = ?$$

36. To subtract two Unlike Fractions, we must get the same number in the denominators. In the problem, one-half minus three-ninths, the new denominator is two times nine, or 18. Which numbers should be in the numerators of the Like Fractions? (9, 6) (10, 3)

37. Now subtract the Like Fractions. What is the answer? $\quad \frac{15}{18} \quad \frac{4}{18} \quad \frac{3}{18}$

$$\frac{9}{18} - \frac{6}{18} = ?$$

38. To subtract the Unlike Fractions, one-third and one-fifth, you need to use the common denominator, 15. Use paper to find the numbers that belong in the numerators, and then subtract. What is the difference? $\quad \frac{0}{15} \quad \frac{2}{15} \quad \frac{7}{15}$

39. To subtract the Unlike Fractions, two-thirds and three-sevenths, you need to use the common denominator, 21. Find the new numerators on paper and then subtract. What is the answer? $\quad \frac{6}{42} \quad \frac{1}{21} \quad \frac{5}{21}$

40. Change these Unlike Fractions, three-fourths and two-fifths, to fractions that have a common denominator of 20 and then subtract. What is the difference?
$\frac{1}{20} \quad \frac{7}{20}$

41. To subtract one-half and two-sevenths, you would use the common denominator of 14. Find the numbers that belong in the numerators and subtract. $\quad \frac{3}{14} \quad \frac{11}{14}$

42. Use paper to find if the Unlike Fractions, one-half and one-third, are equal to the Like Fractions, three-sixths and two-sixths. Are they equal? (yes) (no)

43. Is this the correct way to change two-tenths to a fraction that has 30 in the denominator? (yes) (no)

$$\frac{2 \times 3}{10 \times 3} = \frac{6}{30}$$

44. Has five-sixths been changed correctly to twelfths? (yes) (no)

$$\frac{5}{6} = \frac{10}{12}$$

45. Has two-eighths been changed correctly to sixteenths? (yes) (no)

$$\frac{2 \times 3}{8 \times 2} = \frac{6}{16}$$

46. Which kind of fractions can be added without finding new denominators? (like) (unlike)

47. Which kind must have new denominators before they can be added or subtracted? (like) (unlike)

MATHEMATICS **Mf** 9

Fractions **series**

1. Mixed numbers have two parts: the whole number and the fraction. Which part of the mixed number, five and one-half, is the fraction? (5) (one-half)

2. To add two mixed numbers, like one and one-fifth plus four and three-fifths, we look at each part separately. Add the fraction to the fraction and the whole number to the whole number. Which shows the way to add mixed numbers? (1) (2)

(1) $\frac{1}{5} + \frac{3}{5} + 1 + 4$ (2) $1 + \frac{3}{5} + 4 + \frac{1}{5}$

3. We can write the same problem, one and one-fifth plus four and three-fifths, as shown below, with the whole numbers in one column and the fractions in another. Let's add the fractions first. What is one-fifth plus three-fifths? $\frac{3}{10}$ $\frac{4}{5}$

$$
\begin{array}{r}
1\ \frac{1}{5} \\
+\quad 4\ \frac{3}{5} \\
\hline
?
\end{array}
$$

4. Now add the whole numbers: one plus four is five. What is the complete sum?
(5) $\frac{4}{5}$ $5\frac{4}{5}$

5. What is the sum of these mixed numbers: six and three-ninths and three and one-ninth. $9\frac{4}{9}$ $3\frac{2}{9}$

6. What is the sum of these two mixed numbers: two and 3-elevenths and one and 5-elevenths? $2\frac{8}{11}$ $3\frac{8}{11}$

7. To add mixed numbers, do we add the whole numbers to whole numbers and the fractions to fractions? (yes) (no)

8. Add these mixed numbers: eight and seven-ninths and seven and four-ninths.

$15\dfrac{3}{9}$ $1\dfrac{3}{9}$ $15\dfrac{11}{9}$

9. Is eleven-ninths a proper or an improper fraction? (proper) (improper)

10. Eleven-ninths is an improper fraction and must be changed to a mixed number. What is it equal to? $1\dfrac{2}{9}$ $2\dfrac{1}{9}$

11. Add 15 plus one and two-ninths. What is the answer? $16\dfrac{2}{9}$ $15\dfrac{2}{9}$

12. Add these mixed numbers. What is the sum? $12\dfrac{3}{8}$ $12\dfrac{11}{8}$ $8\dfrac{11}{8}$

$$10\dfrac{7}{8}\ +\ 2\dfrac{4}{8}\ =\ ?$$

13. The answer is twelve and eleven-eighths. Eleven-eighths is an improper fraction and must be changed to a mixed number. Which one is it equal to?

$1\dfrac{4}{8}$ $1\dfrac{3}{8}$ $1\dfrac{2}{8}$

14. Add 12 to the mixed number, one and three-eighths. What is the final answer?

$13\dfrac{3}{8}$ $13\dfrac{11}{8}$

15. Which kind of fractions should be changed to mixed numbers? (proper) (improper)

16. Add these mixed numbers, nine and three-fourths plus two and two-fourths, on your own paper. Change the improper fraction to a mixed number. What is the final answer? $11\dfrac{1}{4}$ $12\dfrac{2}{4}$ $12\dfrac{1}{4}$

17. To add the two fractions of these mixed numbers, one and one-third and three and one-fourth, we must first find a common denominator. Which number can be used as a common denominator for one-third and one-fourth?   (7) (12) (8)

18. One-third is equal to four-twelfths and one-fourth is equal to three-twelfths. Now we can add the fractions to the fractions and the whole numbers to the whole numbers.   One and four-twelfths and three and 3-twelfths. What is the complete answer? $4\dfrac{7}{12}$ $4\dfrac{1}{12}$

19. On your paper, add the two mixed numbers, twelve and one-half and eight and one-fifth. The common denominator for one-half and one-fifth is ten. Which of these numbers should be the numerators of the new fractions? (5, 5) (5, 2) (6, 2)

20. Now add the fractions and the whole numbers. What is the sum? $20\frac{2}{10}$ $20\frac{7}{10}$

21. Find the sum of five and one-half and nine and one-third by following the same steps. The common denominator is six. Find the new numerators on your paper and add. What is the sum? $13\frac{2}{6}$ $14\frac{5}{6}$ $14\frac{1}{6}$

22. Subtract this problem on your paper. Three and five-ninths minus one and four-ninths. Subtract the fraction from the fraction and the whole number from the whole number. What is the answer? $2\frac{1}{9}$ $4\frac{1}{9}$

23. Now work this subtraction problem. Fifty and seven-eighths minus thirty-four and three-eighths. What is the answer? $6\frac{3}{8}$ $16\frac{4}{8}$ $26\frac{5}{8}$

24. To subtract these fractions, fifteen and one-third and eleven and one-sixth, we must use a common denominator, six. Which pair of fractions have been changed correctly from one-third and one-sixth? $\frac{2}{6}$ and $\frac{1}{6}$ $\frac{3}{6}$ and $\frac{2}{6}$

25. Now subtract eleven and one-sixth from fifteen and two-sixths. Which answer is correct? $4\frac{1}{3}$ $4\frac{3}{6}$ $4\frac{1}{6}$

26. Follow the same steps for this problem: six and eleven-twelfths minus five and two-thirds. The common denominator is 12. Which of these numbers should be the new numerators?   (11, 2) (11, 8) (11, 4)

27. Now subtract. Six and eleven-twelfths minus five and eight-twelfths. Choose the correct answer. $1\frac{3}{12}$ $1\frac{19}{12}$

28. On your paper, write down three and one-fourth minus one and three-fourths. Look at the fractions' column. Can you subtract three-fourths from one-fourth? (yes) (no)

29. No, so we must borrow one from the whole number, three. When we borrow one from three, should the three become two or remain three? (become 2) (remain 3)

30. Which of these fractions is equal to one whole? $\frac{4}{4}$ $\frac{5}{4}$ $\frac{3}{4}$

31. Since we borrowed one from the whole numbers' column, we can write it as a fraction, four-fourths, in the fraction's column. Now the new fraction is one-fourth plus four-fourths, or five-fourths. We can subtract five-fourths minus three-fourths and two minus one. What is the answer? $1\frac{2}{4}$ $1\frac{8}{4}$

32. To subtract the fractions in this problem, five and six-tenths minus two and seven-tenths, borrow one from the whole number five. Five becomes four. The one is written as ten-tenths in the fractions' column. Add it to six-tenths. What is the new fraction? $\frac{16}{10}$ $\frac{4}{10}$ $\frac{10}{10}$

33. Now subtract. Seven-tenths from sixteen-tenths, and two from four. Which of these is correct? $2\frac{11}{10}$ $2\frac{9}{10}$

34. Are these examples of the correct way to borrow one from a whole number and write it as a fraction? (yes) (no)

$$4 = 3\frac{5}{5} \qquad 2 = 1\frac{8}{8} \qquad 10 = 9\frac{16}{16}$$

35. On your paper, write seven minus two-fifths. To subtract, we need to borrow one from seven. All of the fractions below are equal to one. Which one should we write in the fractions' column to have a common denominator with two-fifths?
$\frac{7}{7}$ $\frac{5}{5}$ $\frac{2}{2}$

36. We write it five-fifths. Be sure to change seven to six. Which of these is the correct answer? $7\frac{3}{5}$ $6\frac{3}{5}$

37. Solve this problem: three minus one-half. Remember to borrow one to subtract. What is the correct answer? $2\frac{1}{2}$ $2\frac{3}{2}$

38. What is the correct answer for this problem: eleven minus two-ninths?
$10\frac{11}{9}$ $10\frac{7}{9}$ $11\frac{2}{9}$

MATHEMATICS Mf$_{10}$
Fractions series

1. The fraction one-half means one divided by two. Which part of the fraction means "divided by"? (numerator) (fraction bar) (denominator)

2. Does one-fourth mean "one divided by four" or "four divided by one"?
(one divided by four) (four divided by one)

3. Which does two-thirds mean? (three divided by two) (two divided by three)

4. Since one-half means one divided by two, which is the correct way to write it
as a division problem?

$$2 \overline{)\ 1} \qquad 1 \overline{)\ 2}$$

5. Two will not divide into one, a whole number of times. So we add a decimal point
and a zero after the one. Will two divide into one now? (yes) (no)

$$2 \overline{)\ 1.0}$$

6. When we added the decimal point and the zero after the one, did we change the
value of one? (yes) (no)

7. We also need to put a decimal point in the quotient, above the decimal in the
dividend. Now we can divide. Which number goes in the quotient? (5) (6)

$$2 \overline{)\ 1.0}$$

8. The quotient is read five-tenths. What is five-tenths called: a fraction or a
decimal number? (fraction) (decimal number)

9. Is the fraction one-half, or one divided by two, equal to the decimal number
five-tenths? (yes) (no)

10. Let's find the decimal number that is equal to one-fifth. We divide one by five.
Do we need to add a decimal point and a zero after the one? (yes) (no)

$$5 \overline{)\ 1}$$

11. Next we put a decimal in the quotient and divide. Which is the correct answer?
(5.) (.2) (2.)

$$5 \overline{) \overset{.}{1.0}}$$

12. Is the fraction one-fifth equal to the decimal number two-tenths? (yes) (no)

13. Which shows the correct way to divide one by four? (A) (B)

(A) $4 \overline{) \overset{.}{1.0}}$ (B) $4 \overline{) \overset{.}{.10}}$

14. Four will divide into 10 two times. Does it divide evenly or with a remainder?
(evenly) (with remainder)

15. When you divide four into 10, there is a remainder of two. So we add another
zero to the dividend and divide again. Which number should we write next in the
quotient?   (2) (5) (0)

$$4 \overline{) \begin{array}{l} .2? \\ \overline{1.00} \\ 8 \\ \overline{20} \end{array}}$$

16. The quotient when we divide four into ten is .25, which is read 25 hundredths.
Then one-fourth is equal to which decimal number?   (.25) (.5)

17. Now divide one-tenth. Which decimal number is correct? (1.) (.1)

18. Three-fourths means three divided by four. How many zeros did we need to
add in the division problem for the quotient to come out even? (2) (3)

$$4 \overline{) \begin{array}{l} .75 \\ \overline{3.00} \\ 2\,8 \\ \overline{20} \\ 20 \end{array}}$$

19. Divide to find the decimal number equal to three-fifths. (.57) (.6) (.4)

20. Use the same method to find the decimal number equal to two-fifths. Do the
division on your own paper.   (.6) (.35) (.4)

21. We've divided three-eighths to two decimal places. What is the remainder?

$\dfrac{8}{4}$ $\dfrac{4}{8}$

$$8 \overline{) \begin{array}{l} .37 \\ \overline{3.00} \\ 2\,4 \\ \overline{60} \\ 56 \\ \overline{4} \end{array}}$$

22.   Four-eighths is the remainder, which reduces to one-half.   The decimal number is read 37 and a half hundredths.   Now divide five-eighths to two decimal places. Use paper to find the correct answer. $.62\frac{1}{2}$ $.65\frac{1}{4}$

23.   Divide one by three to two decimal places on your paper.   Does it divide evenly? (yes) (no)

24.   When you divide one by three, there will always be a remainder of one-third, so we round it off to 33 and a third hundredths.   Now divide two-thirds to two decimal places.   Does it divide evenly? (yes) (no)

25.   What is the remainder when you divide two by three? $\frac{1}{3}$ $\frac{2}{3}$ $\frac{3}{2}$

26.   The fraction two-thirds is equal to the decimal number 66 and two-thirds hundredths.   Use your paper to find the decimal number equal to four-fifths. (.8) (.6) (.4)

27.   Which of these is equal to one-third? $.66\frac{2}{3}$ $.33\frac{1}{3}$ $.12\frac{1}{2}$

28.   One-eighth is equal to which of these decimal numbers? (.75) (.25) $(.12\frac{1}{2})$

29.   Can you divide the numerator of any fraction by its denominator? (yes) (no)

30.   If the denominator will not divide into the numerator a whole number of times, what do you need to add? (a decimal) (zeros) (a decimal and zeros)

31.   When you divide, do you get a fraction or a decimal number? (fraction) (decimal number)

32.   Three-fifths of this rectangle is shaded. To change the shaded part to a decimal number, divide.   Three divided by five is how much? (6) (.6) (.06)

33.   What fractional part of this circle is shaded?
$\frac{2}{3}$ $\frac{3}{5}$ $\frac{2}{5}$

34. To express the amount as a decimal, divide two by five. What is the answer?
(. 4) (. 04) (4)

35. Half of this circle is shaded. Which decimal number shows the shaded part?
(. 2) (. 6) (. 5)

36. Now one-third of the circle is shaded. Which decimal number is equal to one-third?
(. 33)   (. 33 1/3) (. 66 2/3)

37. Find the decimal number that tells what part is shaded.   (. 25) (. 75) (. 12 1/2)
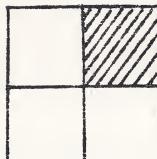
38. If you know that one-fourth is equal to 25 hundredths, then it is easy to find two fourths. It's two times as much as one-fourth. How much is two-fourths?
(. 25) (. 50)

39. Three-fourths is three times as much as one-fourth. How much is it?
(. 75) (. 50) (. 25)

40. If you know that one-fifth is equal to two-tenths, how much is two-fifths?
(. 8) (. 4) (. 2)

41. How much is three fifths? (. 6) (. 5) (. 2)

42. Which is equal to four fifths? (. 6) (. 75) (. 8)

43. One third is equal to 33 and a third hundredths. How much is two thirds?

(. 33 $\frac{1}{3}$)   (. 66 $\frac{2}{3}$)

1. Decimal numbers can be written as fractions. 75 hundredths means 75 over 100. Twelve-hundredths means 12 over 100. Which fraction does the decimal number, .93, mean? $\frac{93}{100}$ $\frac{93}{10}$

2. Choose the correct fraction for the decimal number .55. $\frac{5.5}{100}$ $\frac{55}{100}$ $\frac{55}{10}$

3. These fractions are called decimal fractions: $\frac{25}{100}$ $\frac{41}{100}$ $\frac{98}{100}$. Which number appears in each denominator? (1) (10) (100)

4. Which of these is a decimal fraction? $\frac{20}{30}$ $\frac{38}{100}$ $\frac{1}{19}$

5. Choose the decimal fraction here. $\frac{1}{100}$ $\frac{1}{2}$ $\frac{89}{1}$

6. If the decimal fraction is 87 over 100, which decimal number is it equal to? (.87) (8.7) (87.)

7. Which decimal number is 34 over 100 equal to? (3.4) (.34) (34.)

8. 50 hundredths equals 50 over 100, and means 50 parts per hundred. How many parts per hundred does this fraction mean? $\frac{11}{100}$ (.11) (100) (11)

9. $\frac{250}{100}$ means ___ parts per hundred. (250) (25) (2.5)

10. A short way of writing an amount "per hundred" is to write this sign: %. It means per hundred and is read "per cent." 80 over 100 means the same as 80 parts per hundred and 80 per cent. Does per cent mean per hundred? (yes) (no)

11. Cent comes from the Latin word for one hundred. What per cent does this fraction equal? $\frac{60}{100}$ (100%) (60%)

12. Change the fraction $\frac{105}{100}$ to the equivalent per cent.   (1%) (10. 5%) (105%)

13. Choose the correct per cent for $\frac{7.5}{100}$.   (750%) (7. 5%) (75%)

14. Do these mean the same? (yes) (no) $66\frac{2}{3}\%$ $\frac{66\ 2/3}{100}$

15. Which means the same as 62 per cent? $\frac{62}{10}$ $\frac{6200}{100}$ $\frac{62}{100}$

16. Which does per cent mean? (per ten) (per hundred) (per thousand)

17. Since per cent means per hundred, to change a simple fraction like one-half to a per cent, the denominator must be 100. Multiply the numerator and denominator of one-half by 50. What is the correct per cent? (50%) ($\frac{1}{2}$ %)

18. What number do you multiply by to change one-fifth to hundredths? (10) (20) (50)

19. Which per cent does one-fifth equal? (200%) (20%)

20. Multiply both numerator and denominator of two-fifths by 20. What is the equivalent per cent? (40%) (20%)

21. Which per cent is equal to four-fifths? (40%) (60%) (80%)

22. Which per cent is the same as one-fourth? (20%) (30%) (25%)

23. To change one-eighth to a fraction with 100 in the denominator, multiply both terms by twelve and one-half. One-eighth equals twelve and one-half per cent.

24. Since one-eighth means one divided by eight, we can divide one by eight and get a decimal number. The quotient is 12 and one-half hundredths. Now we can write it as a decimal fraction, 12 and one-half over 100. Choose the correct per cent. ($12\frac{1}{2}\%$) (. $12\frac{1}{2}\%$)

25. To find the per cent for one-sixth, divide one by six on your paper. Write the quotient as a fraction whose denominator is 100, then choose the correct per cent. ($12\frac{1}{2}\%$)   ($16\frac{2}{3}\%$) ($18\frac{1}{3}\%$)

26. The quotient is 16 and two-thirds hundredths and the correct per cent is 16 and two thirds per cent. Find the per cent for five-sixths the same way.

$(67\frac{1}{2}\%)$ $(83\frac{1}{3}\%)$

27. Five divided by six is 83 and a third hundredths. Written as a fraction it is 83 and one third over 100. Then the correct percent is 83 and one-third per cent. What per cent equals three-eighths? $(37\frac{1}{2}\%)$ (35%)

28. Which per cent is the same as one-third? (30%) $(33\ 1/3\%)$ (33%)

29. Two thirds of this circle is shaded. To find what per cent is shaded, divide two by three. Convert the quotient to a fraction over 100 and then to a percent. $(72\frac{1}{2}\%)$ $(66\ 2/3\%)$
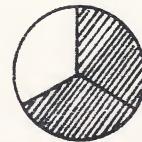
30. What fractional part of this rectangle is shaded?
$\frac{3}{5}$ $\frac{2}{5}$

31. Divide and find the percent that is shaded.
(70%) (60%) (80%)

32. What per cent of this circle is shaded?
(20%) (25%) (30%)

33. What per cent of this circle is shaded?
$(\frac{1}{2}\%)$ (50%)

34. Is three-fifths equal to 60 hundredths? (yes) (no)

35. Are these two equal? $\frac{1}{3}$ $33\frac{1}{3}\%$.   (yes) (no)

36. Which of these is not equal to 75 percent? $\frac{3}{4}$ $\frac{75}{100}$ 7.5

37. Which of these is not equal to 40 per cent? $\frac{2}{5}$ $\frac{20}{100}$ .40

38. Are these equal? $.66\frac{2}{3}$ $66\frac{2}{3}\%$

Practice Folder

MATHEMATICS Mf₁₂
Fractions series

1. There are three values to a percent problem: the percent, the part, and the total. In this percent problem, "25% of 120 is 30", what value is followed by the % sign?   (part) (percent) (total)

2. What value follows the word 'of'?   (part) (percent) (total)

3. The first step in solving any percent problem is to replace 'of' and 'is' with their proper symbols, and 'what' with 'unknown'. Which of these is included in the first step?   (is: =, of: x) (is: x, of: -)

4. What can this problem be changed to? 25% of 120 is 30.   (25% x 120 = 30) (25% = 120 x 30)

5. When either the total or the part is missing, the second step is the same. Do you change the percent to a decimal fraction, a simple fraction, or either? (decimal fraction) (simple fraction) (either)

6. 24 = unknown x 96. What is the next step in solving this problem? Do you move 96 to the other side of the equal sign by dividing both sides by it, or do you change the percent to a fraction? (move 96, divide by it) (change% to fraction)

7. When you move 96 to the other side of the equal sign, are you multiplying both sides by 96, or dividing both sides by 96? (multiply) (divide)

8. 6 = 24/100 x unknown. What is the next step for this percent problem? To get the unknown and the percent on the same side of the equal sign, or to move the fraction to the other side of the equal sign? (get unknown and % on same side) (move fraction to other side)

9. When you move a fraction to the other side of the equal sign, what must you do? (change the sign to times) (invert the fraction)

10. Which step do you do first if the unknown is on the same side of the equal sign as the numbers? (solve the equation) (move numbers to other side)

11. Unknown = 24/100 x 90. What is the next step to solve this problem? (put unknown on one side) (multiply) (put numbers on other side)

12. If a percent problem has the unknown on one side of the equal sign and the numbers on the other, what is the next step? (solve by multiplying or dividing) (read for meaning)

13. A percent word problem is a percent problem in story form. Which of these would a percent word problem have? (3 unknown values) (2 known, 1 unknown)

14. To solve a percent word problem, read the problem to find out what is missing. Then write the percent problem and solve for the missing value. Are there three major steps in solving a percent word problem? (yes) (no)

15. To solve a percent word problem, what must you do first? (change % to decimal fraction) (read the problem for meaning)

16. Do you read a percent word problem to see which value is missing, or to solve the problem? (see which value is missing) (solve the problem)

17. When you know which value is missing, what can you do? (invert the fraction) (write the percent problem)

18. Do you solve the percent problem by solving for the missing value, or identifying the percent? (solving for missing value) (identifying percent)

19. What are the three major steps for solving a percent word problem? (decide whether total, part, or percent is missing) (read, write and solve for the missing value)

20. Now let's look at some percent word problems. Charles had 10 candy bars. He gave 6 of them to his friends. What percent of the bars did he give away? In this problem, 10 candy bars is the total and 6 is the part. Which value is missing? (total) (percent) (part)

21. The total is 10, the part is 6, and the percent is missing. What does this percent problem ask? (What % of 6 is 10?) (What % of 10 is 6?)

22. Bob has 24 stamps. 75% of them are American stamps. How many of his stamps are American? In this problem, 24 stamps is the total. What value is missing? (part) (percent)

23. Which is correct for this problem? (24 is 75% of what number?) (What number is 75% of 24?)

24. Mary had 12 books. She read 4 of them. What percent of the books did she read? What is the missing value here? (percent) (part) (total)

25. Which is correct for this problem? (What percent of 4 is 12?) (What percent of 12 is 4?) (What number is 4% of 12?)

26. Mr. Allen has planted wheat on 8% of his land. He has 24 acres in wheat. How many acres of land does Mr. Allen have? What is the missing value in this problem? (percent) (total) (part)

27. Which is correct? (8% of what number is 24?) (8% x 24 = unknown)

1. Jack had 12 out of 15 answers correct on his test. What percent of his answers were correct? To solve this problem, first read it to find out what is missing: the percent. Second, write the problem: "What % of 15 is 12?" Third, solve: unknown times 15 equals 12. Divide both sides by 15, and the unknown equals point 80 or 80%. In this problem, is this statement correct? Total - 15, Part - 12, % - 80%? (yes) (no)

2. Jane had 18 hair ribbons. She gave 50% of them to her sister. How many ribbons did she give to her sister? First, read the problem to find out what is missing: the part. Second, write the problem: "What number is 50% of 18?" Third, solve. 50% is $\frac{1}{2}$. So what is the correct answer? (9) (36)

3. George sold 30% of the cars on the lot. He sold 24 cars. How many cars were on the lot? To solve, first read the problem to find out what is missing: the total. Second, write the percent problem: 30% times unknown equals 24. Third, solve. 30/100ths times unknown equals 24. Invert the fraction and multiply both sides by it. Unknown equals 24 times 100/30ths. What is the correct answer? (72) (80) (88)

4. A city has a population of 150,000 people. 55% are female. How many females are there? First, read the problem to find out what is missing: the part. Second, write the percent problem, and third, solve. What is the correct answer? (67,500) (75,000) (82,500)

5. A day is 24 hours long. The average person sleeps for 8 hours. What percent of his time does he sleep? Read the problem to find out what is missing: the percent. Then write the percent problem and find the correct answer. (30%) (33 1/3%) (15%)

6. There were 112 trees in an apple orchard. A swarm of locusts destroyed 25% of them. How many trees were destroyed? Find out what is missing, then solve this problem. (28) (84) (25)

7. Solve this problem. Fred went hunting. He used 45 shots to kill 9 rabbits. What percent of his shots killed rabbits? (15%) (17%) (20%)

8. Solve this percent problem. 25% of all the cars sold in July in Scranton were used cars. 250 used cars were sold. How many cars were sold in Scranton in July? (100 cars) (1000 cars) (500 cars)

9. Two percent of the people who took chances on the raffle won prizes. If 26,000 people bought chances, how many won prizes? (520) (5,200) (13,000)

10. A farmer planted 1,000 acres of land in crops. He planted potatoes in 38% of the land. How much land is planted in potatoes? (260 acres) (380 acres) (620 acres)

11. Which of these is a step you follow in solving a percent word problem? (read the problem to find out what is missing) (write the percentage problem, then solve it) (both)

12. Sarah Lou has a stack of 28 magazines. 75% of them are movie magazines. The rest are fashion magazines. How many of each kind does she have? This problem has two things missing: the part (how many movie magazines), and the difference between the total (28 magazines) and the part. Write the percent problem to solve for the part: What number is 75% of 28? Then solve for the part. Unknown equals 75% times 28. 75% is 3/4, so unknown equals 21. The part is 21 movie magazines.

13. Now solve for the number of fashion magazines. The total magazines, 28, minus the movie magazines, 21, equals 7 fashion magazines. Does this problem have: (two answers) (a percent problem and a subtraction problem) (both)

14. There is a total of 180 apartment buildings in the city. 80% of them are brick. The rest are wooden. How many brick buildings are there? How many wooden buildings are there? First, there are two things missing: the part (how many brick buildings), and the difference between the total (180 apartment buildings) and the part. Second, write the percent problem to find the part (the brick buildings). Then subtract the part from the total to find the difference (the number of wooden buildings). What is the correct answer? (120 brick, 60 wooden) (144 brick, 36 wooden)

15. 60% of the people in a city are males. There are 45,000 males. How many people are there in the city? How many of the people are females? There are 2 things missing: the total (how many people in the city), and the difference between the total and the part (the number of males). Solve the problem, and find the correct pair of answers. (72,000 total, 27,000 females) (75,000 total, 30,000 females)

16. Mary had 25 dresses. She gave 20% of them to Carol. How many dresses did Mary keep? How many did she give to Carol? Which is correct for this word problem? (solve for the total, then add) (solve for the part, then subtract)

17. Which of these answers is correct for the above problem? (Mary kept 20 dresses, gave 5 to Carol) (Mary kept 6 dresses, gave 19 to Carol)

18. Amos ate 25% of the cookies in the box. There were 28 cookies in the box. How many did Amos leave? Find how many cookies Amos ate (the part) before you find how many cookies were left. Do you solve for the part, then subtract to find the answer? (yes) (no)

19. Mr. Abrams loaded 12 boxes of drugs on his truck. This was 6% of his supply of drugs. How many boxes of drugs were not loaded on the truck? To solve, which do you do? (find 6% of what number is 12, then subtract) (find what number 6% of 12 is, then add)

20. What was the number of boxes not loaded on the truck? (212) (7.2) (188)

21. THE WHOLE THING IN ANY PROBLEM ALWAYS EQUALS 100%. If you subtract the given percent from 100%, you can find the remaining percent. In the last problem, 6% of the drugs were loaded on the truck. 94% were not loaded because 100% minus 6% is 94%. To find the remaining percent when one percent figure is given, which do you do? (subtract from 100%) (add to 100%)

22. Betsy plants a flower garden each spring. She plants 60% petunias; the rest are mixed varieties. What percent are mixed varieties? Subtract 60% from 100% to find the correct answer. (20%) (40%) (140%)

23. Which of these is correct? (whole thing equals 50%) (subtract from 100% to find remaining percent)

24. Joan ate 80% of the ice cream on her plate. What percent of the ice cream did she leave on her plate? (20%) (30%) (50%)

25. Read this percent problem carefully, then find the correct answer. The window washer cleaned the windows on 90% of the buildings on Oak Street. There are 20 buildings on Oak Street. What percent did he not clean? (2 buildings) (10%) (20%)

26. Sam raises collies. He has 120 collies and 20% of them are full grown. How many are puppies? This problem can be solved in one of two ways. You can solve this problem either by subtracting the percentages from 100% at the beginning, or by subtracting the part from the total at the end. Solution 1: If 20% are full grown, then 80% (100% minus 20%) are puppies. The problem is "what number is 80% of 120?" 80% is 4/5ths. Sam has 96 puppies. Is there another way to solve this problem? (yes) (no)

27. Here is solution 2. 20% of 120 is the number of full grown collies. 20% times 120 equals unknown. 20% is 1/5. 24 is the number of full grown collies. The

number of puppies is the total, 120, minus the full grown, 24. There are 96 puppies. Did the first solution give the wrong answer, or did the two solutions give the same answer? (1st solution wrong answer) (2 solutions same answer)

28. Joe has 16 shirts. 37.5% of them are old. How many of his shirts are new? You can do this problem two ways: first, find out what percent are new, and then find what part of 16 that percent is, or, find how many are old and subtract from the total shirts to find how many are new. Solve the problem and find the correct answer. (14) (8) (10)

29. Jim rode 15 miles. He was 60% of the way to town. How many more miles did he have to go? To solve: write 15 miles is 60% of what number? 60% is 3/5ths. Multiply each side of the equation by 5/3rds. 25 is the total miles. Jim rode 15 miles, and 25 minus 15 is 10. So he had 10 more miles to go. What was the first value found? (total number of miles to town) (how far Jim had gone)

30. Alex worked 20% more on Tuesday then he worked on Monday. He worked 10 hours on Monday. How many hours did he work on Tuesday? To solve: first, find 20% of 10 hours, then add that to 10 hours. What is the correct answer? (14 hours) (12 hours) (8 hours)

31. The city dump receives 100 tons of newspapers and 700 tons of other trash each week. What percent of the total trash each week is newspapers? (14 2/7%) (12 ½%) (70%)

32. To solve a percent word problem, what do you do? (solve for the part, then subtract) (read, write, and solve for the missing value)

33. Which of these describes what must be done to a percent word problem before it can be solved? (subtract the part from total) (write the percent problem)

34. What is the whole thing equal to? (100%) (part + total) (both)

1. One afternoon early in March, Connie Williams came home from school with a very exciting story to tell her mother. Her sixth grade class was going to plant a garden. She brought a letter from the teacher which explained some of the details.

2. Dear Parents: As you may know, Mr. Paul Jones, the newly retired vocational agriculture teacher, owns some vacant lots adjacent to the school grounds. He has offered to let the members of my sixth grade class plant a garden on a plot of ground 70 feet by 50 feet.

3. We have decided to divide the garden equally among all the students and let each student plant and cultivate his (or her) own part. There are 15 boys and 20 girls in the class, so you can see each student will have about the right amount of ground for a garden. A local feed and seed store has offered to furnish the seeds and loan us any garden tools we need.

4. The pupils are all very excited about the project and we feel they will acquire some useful knowledge from this experiment. You will be informed of further developments as they occur. Sincerely yours, (Miss) Beatrice Russell.

5. Which of these was Mrs. Williams told in the letter? (1) that there are more boys than girls in the class. (2) that each pupil promised to do his share in planting the garden. (3) that every pupil is to get an equal share of the garden plot (1) (2) (3)

6. Before they divide the plot equally among all the students, what will they need to figure? (1) how many more girls than boys there are in the class (2) how large a part of the class each pupil represents (3) how to measure the length of the garden plot (1) (2) (3)

7. There are 15 boys and 20 girls. How many students altogether? (35) (45) (36)

8. Then what part of the garden will be assigned to each student? $\frac{15}{35}$ $\frac{1}{35}$ $\frac{20}{35}$

9. Which is the correct way to find the area of the garden plot? (70' divided by 50') (70' plus 50') (70' times 50')

10. How many square feet does the plot contain? (3500) (350) (120)

11. How many square feet will each pupil get? (1000) (10) (100)

12. Connie wondered what fraction of the garden plot the girls would have altogether? Which fraction represents this part? (35 x 1/20th) (1/35th x 20) (20 divided by 5)

13. Susan asked Connie if she could answer this question: The number of boys in the class is what percent of the number of girls? Connie figured it this way and said it was 75%. Was she correct? (yes) (no)

$$\frac{15}{20} = \frac{3}{4} = 75\%$$

14. One afternoon in April, Susan Williams had some news for her brother Roger as they walked home from their classes at Jefferson Junior High. Here's what she told him.

15. School is out next Friday because there's a teacher's meeting. My class and the other ninth grade classes at Jefferson have decided to have a picnic at West Side Park Friday afternoon. Mr. and Mrs. Smith are coming to the picnic, too. They're going to help us gather up the things we'll need to play softball, badminton and some other games.

16. I'm on the food committee and we've decided to have root beer and hot dogs. We're going to buy enough so there'll be two cups of root beer and 3 hot dogs apiece. All the ninth graders are invited, but we're only planning on 108 because 17 have already said they couldn't come. You know we sold candy and pop at the basketball games last winter and earned $38.50.

17. We can spend all of this on our picnic. What we need to know right away is "Is this enough money?" Roger offered to help her answer this question if she could tell him how much everything cost. Here's what Susan knew: The root beer costs 88¢ per gallon and each pint makes two cups. Hot dogs come in packages of ten for 60¢. Hot dog buns are 35¢ per dozen.

18. Before they can decide if $38.50 will pay for the food, Roger and Susan will need to know whether the class has enough money to pay for which of these? (just the root beer) (just the hot dogs) (all the food and drink)

19. Which of these things that Susan told Roger will they not use to answer the question? (ten hot dogs cost 60 cents) (that 17 ninth graders couldn't come) (root beer cost 88 cents a gallon)

20. Susan and Roger decided to figure the cost of the root beer first. Roger said he knew there were 16 cups in a gallon. Was he correct? (yes) (no)

21. Susan said the total number of cups needed would be 108 times 2 because 108 students were coming and each was allowed two cups. How would they figure the number of gallons needed? (108 divided by 2 times 16) (108 times 2 divided by 16) (108 times 16)

22. Roger wrote this as a fraction and cancelled. How many gallons did he find were needed? $(12\frac{1}{2})$ (14) $(13\frac{1}{2})$

23. What should they do to figure the cost of the root beer? (multiply) (add) (divide)

24. How much will the root beer cost? ($10.88) ($11.88) ($11.00)

25. Roger said they found the cost of the root beer by first multiplying 108 times 2, then dividing by 16 and multiplying the result by 88 cents. Was he correct? (yes) (no)

26. Susan said the number of hot dog buns they needed could be found by multiplying the number of pupils by the number of buns allowed each pupil. Was she correct? (yes) (no)

27. Since the buns were 35 cents per dozen, how should she figure the cost? (324 times 12 divided by $.35) (324 divided by 12 times $.35)

28. How much will the hot dog buns cost? ($10.45) ($9.45) ($9.55)

29. Roger and Susan know that three hot dogs are allowed each pupil and they are priced at 60 cents for a package of ten. How will they figure how many hot dogs to buy? (add) (subtract) (multiply)

30. How many hot dogs should they buy? (324) (332) (36)

31. How will they figure the cost of the hot dogs? (324 times 10 over 60) (324 over 10 times $.60) (324 minus 60 over 10)

32. Is the total cost the same as 324 times 6 cents (or 6 hundredths dollars)? (yes) (no)

33. How much will the hot dogs cost? ($20.44) ($19.84) ($19.44)

34. How will they figure the total cost of the picnic? (add) (subtract) (multiply)

35. Here's their list of items and the cost of each. What is the total?
($40. 67) ($40. 77) ($41. 77)

root beer	$11. 88
hot dog buns	9. 45
Hot dogs	19. 44
	?

36. Will the class have enough money? (yes) (no)

37. How much more do they need? ($1. 27) ($2. 27) ($2. 37)

38. Which of these statements is true? (1) The class needs $2. 27 more to pay
for the food. (2) The class has the exact amount saved. (3) The class will have
money left after paying for the food.   (1) (2) (3)

MATHEMATICS Mf 15
Fractions series

1. The area of a circle is the amount of space inside a circle. It is always measured in square units. Which of these is a square unit? (feet) (square feet) (cubic feet)

2. When we measure the area of a circle, we want to know how many square units are inside it. As you can see, trying to put square units inside a round circle is like trying to put square pegs into a round hole. Because of this problem, we have to use a special number called pi. Without this special number, is it easy to find the area of a circle? (yes) (no)
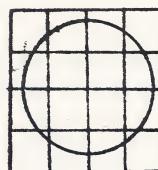
3. Pi is usually written like this: 𝜋   Which of these is correct? (pi = 𝜋) (𝜋 is used to find area of a circle) (both)

4. Pi is a number and can be written two different ways. As a decimal number, pi is approximately equal to three point one four; and as a fraction pi is equal to about 22/7ths. Which of these numbers can we use to find the area of a circle? (33/7) (3.14) (both)

5. What are 22/7ths, and three point one four? (𝜋) (numbers to find area of circle) (both)

6. Does pi stand for all of these: 𝜋 , 3.14, 22/7ths? (yes) (no)

7. We find the area of a circle by multiplying pi times the radius times the radius. Substitute into the formula: three point one four times two inches times two inches. Now multiply. What is the area? (3.14 square inches) (12.56 square inches)

2 IN
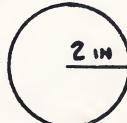
8. To find the area of this circle, substitute three point one four for pi and three inches for the radius. What is the area? (28. 26 square inches) (3. 14 square inches)
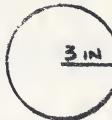
9. Use the formula: area equals pi times radius times radius. Which shows the correct substitution into the formula? (3. 14 x 1 ft.) (3. 14 x 1 ft. x 1 ft.)
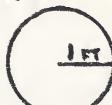
10. What is the area? (3. 14 sq. ft.)
(. 14 sq. ft.) (5. 00 sq. ft.)

11. The formula for area can also be written: pi times r times r. Does "r times r" mean to multiply the radius times the radius? (yes) (no)

12. We can further shorten the formula to area equals pi times r squared. R squared means r times r. Which words complete this sentence? "r^2 means _____ the _____ times itself. " (multiply, diameter) (multiply, radius)

13. Which is the formula for the area of a circle? (π x r^2) (π x d)

14. To find the area of this circle, we'll use the fraction 22/7ths for pi. Write the formula: area equals pi times r squared. Then substitute: 22/7ths times 7 times 7. Multiply and cancel. What is the area of the circle? (100 sq. in.) (150 sq. in.) (154 sq. in.)
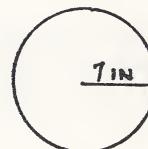
15. Again we'll use the fraction 22/7ths for pi. Write the formula: area equals pi times r squared. Substitute: 22/7ths times two times two. Then solve. (12 4/7 sq. ft.) (20 sq. ft.)
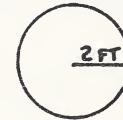
16. Which of these shows the correct substitution for this circle? (area = 3. 14 x 5 ft. x 5 ft.) (25 sq. ft. = π x 5 ft.)
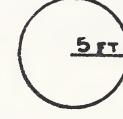
17. What is the special number we use to find the area of a circle? (π) (r x r) (both)

18. Which of these is the value for pi? (7/22ths) (3. 14) (both)

19. Are all these formulas for finding the area of a circle? $\pi \times r^2$, $\pi \times$ radius $\times$ radius, $\pi \times r \times r$. (yes) (no)

20. We can find the circumference of a circle by multiplying two times pi times the radius. Is this the distance around a circle, or the area of it? (distance around) (area)

21. To find the circumference of this circle, use the formula: two times pi times r. Substitute for pi and the radius, then multiply. What is the circumference? (3. 14 ft.) (62. 8 ft.)

10 FT
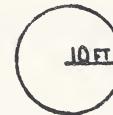
22. Use the formula two times pi times r to find the circumference. Then substitute: two times 22/7ths times 7 inches. What is the circumference? (41. 96) (44 in.) (10 sq. in.)

7 IN

23. Which of these shows the correct substitution into the formula for this circle? (2 x 4 x 31. 4 ft.) (2 x 3. 14 x 2 ft.)

2 FT
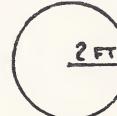
24. Is $\pi \times r^2$ the formula for circumference or area? (circumference) (area)

25. Which formula is this? $2 \times \pi \times r = ?$ (circumference) (area)

26. What is the distance around a circle? (diameter) (circumference) (area)

27. Is the number of square units inside a circle the area or the circumference? (area) (circumference)

28. Which of these gives the area of a circle whose diameter is fourteen inches? (3. 14 x 14 x 14) (3. 14 x 7 x 7)

29. Which gives the circumference of this circle? (2 x 3. 14 x 7) (2 x 3. 14 x 14)

14 IN

30. What is the circumference of a circular tire whose radius is twelve inches? (75. 36 in.) (75. 36 sq. in.)

31. What is the circumference of a drainage pipe with a radius of one foot? (6 sq. ft.) (6. 28 ft.) (13. 58 ft.)

32. What is the area of a circular plot of ground with a radius of 28 feet? (24. 64 sq. ft.) (2464 sq. ft.) (246. 4 sq. ft.)

33. What is the circumference of a circular swimming pool whose radius is eleven feet ? (69.08 ft.) (60.08 ft.) (30 sq. ft.)

34. How many square feet are inside a circular plot of land with a radius of seven feet ? (44) (154)

35. How many feet of wire will it take to fence off a circle with a radius of six feet ? (37.68 ft.) (113.04 ft.)

MATHEMATICS Mf 16
Fractions series

1. This is a six inch ruler. What does each number on it represent? (1 inch) (1 foot)

1	2	3	4	5	6
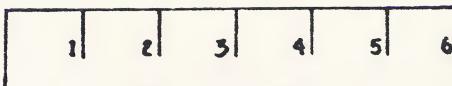
2. Arrow A points to one inch. What does Arrow B point to? (3 inches) (4 inches) (5 inches)

A   B

3. The length of Line X is three inches. What is the length of Line Y? (4 inches) (5 inches)

X
Y

1	2	3	4	5	6
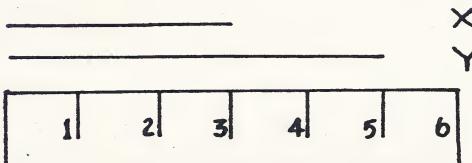
4. The length of Bar M is one inch. What is the length of Bar N? (5 inches) (6 inches)

M
N

5. What is the distance between points A and B? (4 inches) (3 inches)

1	2	3	4	5	6

A←————→B
X←————→Y
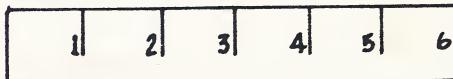
6. What is the distance beeween points X and Y? (5 inches) (3 inches) (2 inches)

7. What is the distance between points P and Q? (3 inches) (1 inch) (2 inches)
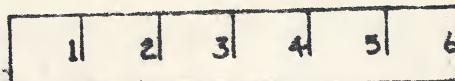
8. What is this distance? (5 inches) (4 inches) (6 inches)

9. On this ruler each inch is divided into parts. How many parts to one inch? (4) (2) (3)
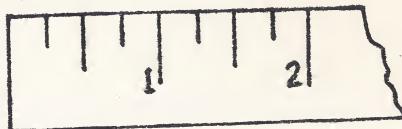
10. Are the parts, A, B, C, and D, equal or unequal? (equal) (unequal)
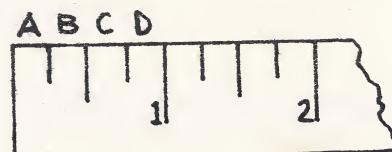
11. How many fourths equal one inch? (3) (2) (4)

12. Arrow A points to the one-half inch mark on this ruler. What does Arrow B point to? ($2\frac{1}{2}$ inches) ($1\frac{1}{2}$ inches) (2 inches)
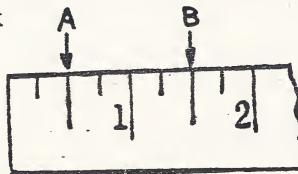
13. What does Arrow X point to? (4 inches) ($5\frac{1}{2}$ inches) ($4\frac{1}{2}$ inches)
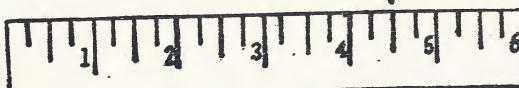
14. Line P is at the one-fourth inch mark. Where is Line R? ($2\frac{1}{2}$ inches) ($2\frac{1}{4}$ inches) (2 inches)
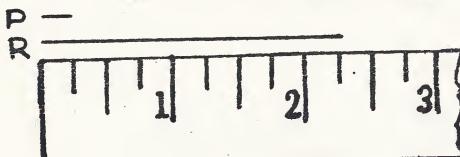
15. How long is Bar M? (1/4 inch) (2/4 inch) (3/4 inch)
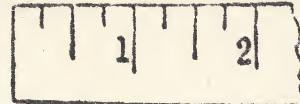
16. How long is Bar Z? (2 3/4 inches) (2 1/2 inches)
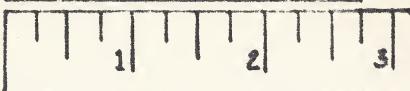
17. Into how many parts is each inch on this ruler divided? (7) (8)
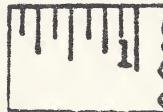
18. What is each part called? (1/7 of an inch) (1/8 of an inch)

19. How many eighths equal one inch? (7) (6) (8)

20. Arrow F points to one-eighth. What does Arrow G point to? (4/8) (5/8) (6/8)
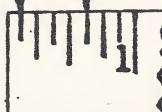
21. How long is Line S? (3 2/8 inches) (3 1/2 inches) (3 3/8 inches)
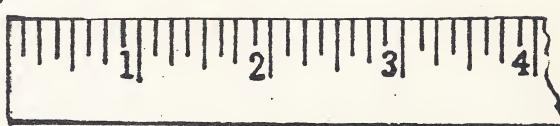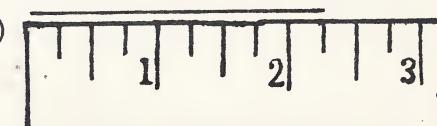
22. What is the length of this line? (2 1/4 inches) (2 1/8 inches) (2 1/16 inches)
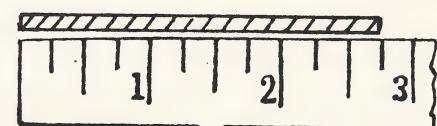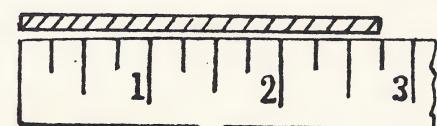
23. What is the length of this bar? (2 1/2 inches) (2 3/8 inches) (2 3/4 inches)

24. Find the length of this bar. (1 3/8 inches) (3/8 inch) (1/2 inch)
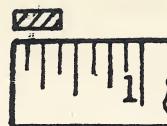
25. Which is the length shown here? (1 7/8 inches) (1 6/8 inches) (1 3/4 inches)
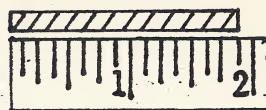
26. Into how many parts is each inch of this ruler divided? (12) (15) (16)

27. How many sixteenths is one inch? (16) (4) (8)

28. Find the length of this line. (1 7/8 inches) (1 7/16 inches)
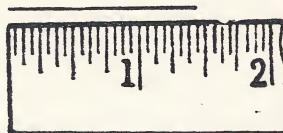
29. Find the length of this bar. (15/16 inch) (1 15/16 inches) (1 31/32 inches)

30. There are also rulers that are divided into 32 parts for each inch and 64 parts per inch. Each division is a fraction or part of an inch and is used to get a more accurate measurement. Which gives a more accurate measurement? (ruler divided into 32 parts per inch) (ruler divided into 64 parts per inch)

31. Which ruler would you use to get an accurate measurement of a line two and one thirty-second of an inch long? (1/4) (1/32) (1/8)

32. Which ruler would you use to get an accurate measurement of a line five and seven sixty-fourths of an inch long? (1/32) (1/64)

33. Which ruler would you use to measure a line 1 1/4" long? (1/4) (1/8)

34. If you want a measurement to the closest eighth of an inch, which ruler would you not use? (1/8 inch) (1/4 inch) (1/16 inch)

35. If you wanted to measure one thirty-second of an inch, which ruler would you not use? (1/32) (1/64) (1/16)

36. This ruler is called a one-fourth inch ruler because each inch is divided into fourths. What is the other ruler called? (1/4 inch) (1/8 inch)
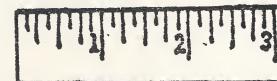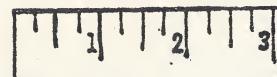
37. Which parts of an inch does the one-fourth inch ruler accurately measure? ($\frac{1}{2}$" and $\frac{1}{4}$") (1/4" and 1/8")

38. What does the one-eighth inch ruler measure accurately? (1/8", 1/4", 1/2") (1/8", 1/16")

39. What is this ruler called? (1/32") (1/16") (1/8")

40. Which units does it measure accurately? (1/16", 1/32", 1/64") (1/16", 1/8", 1/4", 1/2")

41. Which kind of ruler is this? (1/32") (1/64") (1/48")
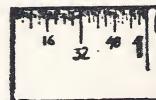
42. If the line you are measuring falls between the divisions of the ruler, you must round it to the nearest division. This line is one and four and a half eighths inches long. So you would round it to one and five-eighths inches.
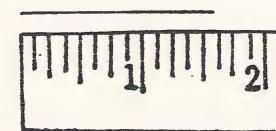
43. What is the length of this line, to the nearest eighth of an inch? (2/8) (3/8)

44. What is the length of this line? (1 8/8") (2") (both)
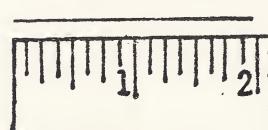
45. If your ruler is divided into sixteenths and your answer should be in eighths, then you will have to convert your length from sixteenths to eighths. Suppose the length measures ten sixteenths. That is equal to five eighths.

46. If the length of a line is thirteen and one-half sixteenths, what is the length to the nearest eighth?   (7/8) (6/8)

47. Which is this line closest to?
(3/8) (4/8)